COMMERCIAL FISHERIES
ABSTRACTS

C. F. T. R. I.
FISH TECHNOLOGY EXPERIMENT STATION,
Hoige Bazaar, MANGALORE-1.
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UNITED STATES DEPARTMENT OF THE INTERIOR
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FISH TECHNOLOGY EXPERIMENT STATION,
Hoige Bazaar, MANGALORE-1.

0.32 NATURE OF PROTEIN REQUIREMENTS -- WAYS THEY CAN BE MET IN TOMORROW'S WORLD

Scrimshaw, Nevin S. (Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge)
Journal of the American Dietetic Association 54, No. 2, 94-102 (February 1969)

The population of Latin America is doubling every 27 years; that of Central America, every 20 years. The population of the world will be double its present size somewhere near the end of this century. As the population explosion continues, providing protein will become much harder than providing calories. Thus it is essential for nutrition and dietetics professionals to understand the nature of protein requirements and the problems and the ways of meeting them during the rest of this century. To these issues, the author addresses his lecture. In the first part, he reviews recent advances in the understanding of protein requirements; in the second, he considers how both conventional and unconventional sources of protein can be used to meet those requirements now and in the future.

There is no such thing as a requirement for protein in the diet; the requirement is for certain of the amino acids that constitute protein. These amino acids must be accompanied by enough nitrogen in any utilizable form to allow the other amino acids of body proteins to be synthesized. The nitrogen can come from excess essential amino acids, from nonessential amino acids, or from such compounds as ammonium citrate.

The ratio of essential amino acids to total nitrogen is important to the value of the protein. Proteins of animal origin have the highest concentration of amino

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 ABSTRACTER: L. Baldwin

0.7 RECOMMENDED DIETARY ALLOWANCES--1968 REVISION

Sebrell, W. H., Jr. (Institute of Nutrition Sciences, School of Public Health and Administrative Medicine, Columbia University, New York, N.Y.)
Journal of the American Dietetic Association 54, No. 2, 103-108 (February 1969)

"Recommended Dietary Allowances" was first published in 1943. Since then, as advances in knowledge have provided data for better estimates, the allowances have been revised. Now they are the accepted guide for the interpretation of food consumption and the goal in planning food supplies for people in the United States. Since the recommendations are intended to meet the full needs of practically everybody, they are considerably higher than some people need. Thus they should not be interpreted as nutritional requirements for individuals, nor should diets that fail to meet the requirements be considered deficient on that account alone.

The 1968 edition (the sixth revision) includes seven nutrients not previously tabulated: vitamin E, folacin, vitamin B_6, vitamin B_{12}, phosphorus, magnesium, and iodine. It also changes some of the age categories: males and females are separated from age 10 to age 18 in increments of 2 years, and an 18-to-22-year-old category is added; infants under 1 year of age are separated into 0-to-2-month groups, 2-to-6-month goups, and 6-to-12-month groups.

For estimating a recommended allowance for calories, the last three editions have used a "reference" man weighing 154 lb. and a "reference" woman weighing 128 lb.; both are considered to be 22 years old. In this edition, the recommended allowance for the man is 2,800 Calories and for the woman, 2,000 Calories,

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 ABSTRACTER: L. Baldwin

0.5 HEAT RESISTANCE OF SALMONELLA: THE UNIQUENESS OF SALMONELLA SENFTENBERG 775W

Ng, Henry, Henry G. Bayne, and John A. Garibaldi (Western Regional Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Albany, California 94710)
Applied Microbiology 17, No. 1, 78-82 (January 1969)

The salmonellae cause infections in man and in certain species of animals. Their resistance to heat, therefore, is of concern to food processors and to those concerned with public health. Earlier studies indicated that salmonellae are relatively sensitive to heat, but one strain, Salmonella senftenberg 775W, is an exception. For example, Winter et al. (1946) found that S. senftenberg survived almost 5 min. at 60° C. in liquid egg. Because of the uniqueness and potential health significance of this organism, the authors studied its biochemical properties and determined how variations in growth conditions affect its resistance to heat. In addition, they checked the frequency of occurrence of other Salmonellae of equal heat resistance.

Three hundred cultures of Salmonella, representing 75 different serotypes, were examined. None was found to be as heat-resistant as S. senftenberg 775W. It was 30 times more heat-resistant than S. typhimurium Tm-1, the reference strain used in this study; S. blockley 2004, the next most heat-resistant strain, was 5 times more heat-resistant. All other strains of Salmonella, including 19

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 ABSTRACTER: F. T. Piskur

1.017 PROBLEMS OF FISHERY DEVELOPMENT

Burdon, T. W. (Fisheries Branch, Department of Primary Industry, Canberra, A.C.T. 2600)
Paper presented to the 13th session of the Indo-Pacific Fisheries Council at Brisbane, October 1968, 16 pp.
In Australian Fisheries Newsletter 27, No. 12, (Supplement, appearing between pp. 24 and 25) (December 1968)

The first part of this paper outlines the nature of fishery development, the benefits consequential on such development, the characteristics of the resources and some of the more important techniques which can be used for promoting development or growth. It also indicates some of the problems which arise in the projects affecting individual fisheries.

This discussion provides the background for the second part of the paper concerning Australian problems. A brief outline of the setting of the Australian fisheries, and the stage of development in a number of these, leads into a discussion of some of the problems of fisheries development and administration in Australia. The recommendations of the Australian Fisheries Development Conference, 1967, insofar as these relate to the need for a national policy, and the lines of action required to implement such a policy, are also discussed. In particular, the need to integrate various development techniques into a co-ordinated pattern of action is emphasized, and a method of programming development projects is suggested.

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 ABSTRACTER: L. Baldwin

0.5

strains of S. senftenberg and 7 strains of S. blockley, and the reference organism had decimal reduction times at 57° C. of about 1 min. Strain 775W is more heat sensitive in the log phase than in the stationary phase of growth. Cells from cultures of strain 775W grown at 44° C. were more heat resistant than were those grown at 35° or at 15° C.; the medium used for growing the organisms had no appreciably effect on the heat resistance of the organism. Cells of 775W grown in a medium limiting in ammonium sulfate as the sole nitrogen source were killed at a much faster rate than were cells from cultures grown in a medium limiting in glucose as the sole carbon and energy source; the latter exhibited a 1-hr. lag period at 55° C. before a significant rate of kill was attained. Strain 775W, for any given set of growth conditions, was always more heat resistant than S. senftenberg 197B (another strain having normal heat resistance).

Further work is now in progress to determine why S. senftenberg is so much more heat resistant than other Salmonellae. Such information may eventually reveal what factors contribute to the heat resistance of bacteria and the mechanism by which heat kills bacteria. [3 figures, 1 table, 19 references]

Giraud, Arthur E., John D. Buck, and Benjamin J. Cosenza (Univ. of Connecticut, Storrs)
Chemical Abstracts 70, No. 1, 106lc (January 6, 1969)

NUTRITIONAL STUDY OF SOME AGAROLYTIC MARINE BACTERIA

0.5 (Cross Reference: 7.86)

1.017

This leads into the major problem--the conflicting needs of the prosperous export fisheries based on molluscan and crustacean resources on the one hand, and the somewhat depressed scale fisheries which rely on the domestic market and are subject to strong competition from imported products on the other. The question as to whether government should co-operate with industry in the development of the prosperous fisheries or whether this be left to industry whilst government activity is concentrated on the "depressed" fisheries is discussed.

Effective fisheries management is considered to be of great importance. However, the problem of integrating fisheries at different levels of development into a single national policy poses questions of policy for development; priorities in use of scarce resources; and responsibility and co-ordination of such programmes. [7 references, 1 flow chart]

Hot cooking fat is centrifuged off fried foods then replaced with fresh fat.
[Abstracter: F. T. Piskur]

German Patent 1,276,428
Deutsche Maizena-Werke G.m.b.H.
Food Technology 23, No. 2, 20 (February 1969)

2.8 FRIED FOODSTUFFS

0.32 (Cross Reference: 0.7)

acids. It has been shown that between 20 and 30 percent (as much as 40 percent in some subjects) of the protein from egg, meat, milk, and fish can be isonitrogenously replaced at low levels of protein intake with no loss in the efficiency of nitrogen utilization. An adequate amount of protein for normal activities is generally less than 30 g. a day--thus the absolute requirements for protein, if the quality is good and the calories are adequate, in healthy individuals are much lower than nutritionists have commonly assumed.

Such conventional sources of protein as milk, meat, poultry, eggs, and fish are costly; the protein from the least expensive of these costs well over $1 a pound. Moreover, the likelihood that production can keep pace with the population increase is remote. Since throughout the world cereals furnish a larger proportion of protein in human diets than all other sources combined, improvements in varieties of cereals and in agricultural practices are of paramount importance.

Among the unconventional sources, the highest priority must go to the oilseed meals, for no protein source is cheaper or more promising. These meals contain about 50 percent protein and can be produced at a cost of as low as 8¢ per pound of protein. They can be readily adapted to human diets, and almost no developing country is without the raw material. Other unconventional sources--such as fish protein concentrate, synthetic amino acids, and single-cell organisms--still have the problems of cost and palatability to overcome. Wholly synthetic foods are too costly to supply the needs of today's underfed peoples.

Only strenuous effort on three fronts can avert the impending protein crisis: (1) effective programs of family planning, (2) prevention of unnecessary loss and waste of protein foods, and (3) greatly increased production of foods from conventional sources, supplemented by nonconventional sources of protein and amino acids. [3 figures, 4 tables, 21 references]

0.7

reflecting a 100-Calorie adjustment in the 1964 allowances to take into account the fact that many people who are already sedentary do not decrease their activity as they grow older. The author suggests that caloric allowances for individual infants (120 Calories per kilogram body weight at birth, reduced to 100 Calories per kilogram by the end of the first year are recommended) should take into account activity and quality of growth as well as weight.

The new edition pays particular attention to carbohydrates and fats because of the increased interest in the relation between lipid and carbohydrate intake and atherosclerosis. People accustomed to normal diets need at least 100 g. of carbohydrate a day to avoid ketosis, excessive protein breakdown, and other undesirable metabolic reactions, the author says. He makes no recommendations either about the total fat required or about the proportion of linoleic acid needed.

The nitrogen balance method of estimating protein requirements is not used in this edition. Instead, the requirement for ideal protein per day is calculated (basal Calorie requirement × mg. per basal Calorie ÷ 1,000); a 30-percent variability factor and a 70-percent utilization factor are added, giving 65 g. per day of protein for the reference man. The requirement for infants allows for the partial or total substitution of formula diets for mother's milk; in such instances the author advises applying a quality correction factor based on human milk protein.

Recalculations and application of new information about vitamins and minerals have led to changes in the requirements and addition of new ones. In particular, the evidence of widespread iron-deficiency anemia in the United States has led to appreciable re-evaluation of recommended iron allowances. The importance of trace elements is recognized, but no allowances are established, nor are any established for sodium, potassium, or chloride. [2 references, 3 tables]

1.125 CATCH AND ESTIMATES OF FISHING EFFORT AND APPARENT ABUNDANCE IN THE FISHERY FOR SKIPJACK TUNA (KATSUWONUS PELAMIS) IN HAWAIIAN WATERS, 1952-62

Uchida, Richard N. (Biological Laboratory, Bureau of Commercial Fisheries, Honolulu, Hawaii 96812)
Fishery Bulletin 66, No. 2, 181-194 (August 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

Skipjack tuna (Katsuwonus pelamis Linnaeus) supports Hawaii's most important commercial fishery. It constitutes about 66 percent by weight of the total marine catch and accounts for about 40 percent of the total annual ex-vessel value. The fishery is highly seasonal, landings ranging from about 29,000 lb. in January 1952 to about 3,700,000 lb. in July 1954. It also fluctuates by year, the catch ranging from 6,130,000 lb. in 1957 to 14,021,000 lb. in 1954.

In the past, total catch and catch per unit of effort (that is, uncorrected fishing effort calculated in terms of productive trips of all sizes of vessels) have been used as measures of the abundance of skipjack in Hawaiian waters. As a rule, however, total catch is seriously affected by changes in the amount of fishing effort expended and by weather and sea conditions, and catch per unit of effort calculated in terms of uncorrected fishing effort generally varies with the size and number of vessels participating in the fishery. The present author uses detailed catch and effort data to show the fluctuations in catches from 1952 through 1962 and to derive a standard unit of fishing effort that, because it is

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 ABSTRACTER: L. Baldwin

2.110 HOW 1968 VESSEL DEVELOPMENT WAS AFFECTED BY FISHERIES

Gilbert, John W.
Fish Boat 13, No. 12, 36-37, 85-87 (December 1968)

The successes and failures within a given fishery over a period of years are clearly reflected in the changes and improvements made to the vessels and the gear. Success is measured in terms of the total cost for a given return; thus such factors as time, manpower, and cost and capability of vessel and equipment are always considerations. The author gives examples of some of the changes resulting from the successes of certain 1968 fisheries.

In every fishery, horsepower has been increased, both in the main engines--to increase speed and towing power--and in the auxiliary equipment--to decrease the number of men required and to increase the handling capability of the vessel.

In addition to the increased refrigeration capacity of their vessels, shrimp fishermen are changing to more efficient methods of powering the refrigeration plant. They are turning increasingly to individual diesel engines and electric or hydraulic motors powered from auxiliary sets, and are considering a.c. electric systems of sizable capacity to power not only the refrigeration plant but all the auxiliary equipment. Of note in the 1968 shrimp fishery was installation of the first hydraulic winch specifically designed for shrimp fishing.

In the Gulf Coast menhaden fishery, the size, shape, and structural materials of the vessels are the most noticeable evidence of technological change. These

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 ABSTRACTER: L. Baldwin

2.05 THE SURVIVAL OF PATHOGENIC BACTERIA IN, AND THE MICROBIAL SPOILAGE OF, SALADS, CONTAINING MEAT, FISH AND VEGETABLES

Holtzapffel, D. (Koninklijke Fabrieken T. Duyvis Jz. N.V., Koog aan de Zaan, The Netherlands), and D. A. A. Mossel (San Marcos University, Lima, Peru)
Journal of Technology 3, No. 3, 223-239 (September 1968)

Salads made from meat or fish and dressed with cream or mayonnaise are perishable and are a more or less suitable medium for certain microorganisms. Because of the increasing use of such convenience foods, the authors studied two types of commercially prepared salad. Special attention was paid to the fate of food-borne pathogens when the salads were stored at temperatures above the range of refrigeration. Two lots each of one type of shrimp salad and one type of meat-and-vegetable salad from freshly manufactured commercial batches were tested. The two lots within each type were preserved at different levels of a benzoic acid-sorbic acid (1:2) mixture: one at 0.15 percent, the other at 0.30. The shrimp salad contained a mayonnase dressing, had a pH of 5.3, and had an acetic acid content of 0.3 percent. The meat-and-vegetable salad contained a salad cream dressing, had a pH of 4.2, and had an acetic acid content of 0.5 percent. Samples of the four salads were inoculated with Staphylococcus aureus, Salmonella typhimurium, Salmonella panama, Clostridium perfringens, and Bacillus cereus. The inoculated samples were stored at 20° and 9° C.; noninoculated samples were stored at 3° C. For lactic acid bacteria and the yeasts, dependence was placed on the

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 ABSTRACTER: L. Baldwin

2.1121 A MACHINE FOR WINDING TRAWL CABLE

Ellis, Ian E. (Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, U.S. Fish and Wildlife Service, Seattle, Washington 98102)
Commercial Fisheries Review 31, No. 1, 31-34 (January 1969) (Separate No. 833)

An inexpensive device has been developed for winding steel trawl cables between winches and storage reels. It is compact, making storage easy; relatively light (it weighs about 250 lb.), making handling easy; and quite stable. The device has three major components--a reel lifter-stand, an axle, and a drive unit.

The reel lifter-stand consists of a frame of schedule No. 40 steel tubing, a mirror-image frame, and two bearings made of 4-in. OD tubing. Stiffeners, bracing, bearing stems, risers, and the handle are of 2-in. flat steel plate or of 1-in., 1½-in., or 2-in. galvanized pipe.

The axle is made of 2½-in. schedule No. 80 tubing with ends machined to accommodate the bearings and a 1-in. × 2½-in. flat flange welded on one end to hold the drive sprocket. The drive arm is of 1-in. × 2-in. channel steel, butt welded to the axle. It has a slot so that different reels can be attached. Cylindrical or conical adapters can be slipped on the axle if the reels being handled have axles of larger diameter than do those normally driven.

The drive unit is held in place on the lifter-stand by three ½-in. × 2-in. mounting studs and secured by wing nuts. The power source is a 3½ hp., 4-cycle

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 ABSTRACTER: L. Baldwin

ESTIMATING HAWAIIAN SKIPJACK ABUNDANCE

SURVIVAL OF PATHOGENIC BACTERIA IN AND MICROBIAL SPOILAGE OF SALADS

FISHERY-ORIGINATED VESSEL DEVELOPMENT

CABLE-WINDING MACHINE

2.05 (Cross Reference: 2.01)

organisms naturally occurring in the product. The samples were examined at intervals for survival of the pathogenic bacteria and for the development of lactic acid bacteria and yeasts.

In samples stored at 20° C., S. aureus and Salmonellae died off at about 1 decimal reduction every 7 days in the shrimp salads and at greater than 6 decimal reductions per 7 days in the meat-and-vegetable salad. C. perfringens and B. cereus remained dormant. Lactobacillaceae developed rapidly, increasing from an initial count of 10^3-10^6/g. to about 10^9/g., thereby forming 1.0-1.5 percent of lactic acid and further inhibiting the growth of the pathogenic bacteria.

In samples stored at 9° C., S. aureus and the Salmonellae died off much more slowly than at 20° C., the initial pH and the amount of acetic acid in the sample governing the rate. C. perfringens was destroyed slowly; B. cereus remained dormant for up to 2 months.

The wholesomeness of these particular types of fish and meat salads depends entirely on their initial contamination with enteropathogenic organisms. Even so, they sour noticeably within a week when stored at 20° C. and within 2 weeks when stored at 9° C., and they exhibit a considerable degree of yeast-caused fermentation after 2 months' storage at 3° C. The survival of pathogenic bacteria seems to be influenced very little by the presence of preservatives; rather, it depends principally on the concentration of acetic acid and the pH.
[7 tables, 44 references]

1.125 (Cross Reference: 1.0112)

unaffected by changes in the fishing fleet, provides a means of calculating changes in the apparent abundance of Hawaiian skipjack.

Data from records submitted to the Hawaii Division of Fish and Game, from previous analyses, and from skippers' logs provided the material for this report. These data were tabulated to show such variables as the catch by months and years, by areas in which the fish were caught--that is, inshore (within 20 miles of the coast) or offshore (beyond 20 miles)--, by class of vessel (Class 1 being vessels equipped with baitwells that hold 800 gal. or less and Class 2 being vessels with baitwells that hold more than 800 gal.), by length of trip, and by the number of effective trips (the trips during which skipjack are caught); the number of men fishing per boat; and the buckets of bait used. From these tables, efficiency factors for Class 1 vessels were calculated for each of the 11 years; the efficiency factors for Class 2 vessels were fixed at 1.00.

These efficiency factors were then used to calculate the number of standard effective trips, the catch per standard effective trip (Y/f), and the relative effective fishing intensity. Curves for these last two values showed that the Y/f peaked in 1954, 1956, and 1959, as did the curves for the total catch (the total weight landed by vessels fishing full time and by vessels fishing part time). Because of the similarity between the fluctuations of Y/f and total catch ($r = 0.851$, $df = 9$, and $p = <0.001$), the total catch can be used as an index of apparent abundance for 1952-1962; it should not be used as an index for other years. The correlation between Y/f and the relative effective fishing intensity was not significant ($r = 0.343$, $df = 9$, and $p = 0.32$). This lack of correlation suggests that such factors as availability, vulnerability, or the strength of a year class may be more influential on the variation in landings than changes in the amount of fishing effort are. Effective fishing intensity declined over the years, largely owing to a decrease in the number of vessels fishing.

2.1121

gasoline engine with factory-installed reduction gear. The reduction gear drives the axle by means of a chain over the sprockets. Axle speed ranges from 7 to 10 r.p.m.

The device can be set up almost anywhere, even on rough and cluttered docks. Two men can operate it. The procedure is as follows: The reel is put on the axle and the adapter screws are tightened. The handle of each frame of the lifter-stand is raised until the bearings are mated with the bearing surface of the axle; the handles are then pulled down so that the reel is raised. The drive unit is set on the lifter-stand, the drive chain is put in place, and the retaining nuts are tightened till the chain is taut. The device is then ready to wind the cable onto the reel. Although it may slide when a light reel is under tension, it can be easily realigned.

This cable winder has been used extensively since it was built. On one occasion, two 300-fathom sections of 5/8-in. electrical towing cable were transferred from a vessel's winches to storage reels in less than 1 hour. [4 figures]

[Abstracter: F. T. Piskur]

Shipboard conveyor sorts refuse from fish on way to freezer.

British Patent 1,128,263
Schiebautechnik Wolgast
Food Technology 23, No. 2, 78 (February 1969)

2.110

boats must operate in waters 10 ft. deep or less, so hulls are being redesigned accordingly; twin screws are being installed for maneuverability; horsepower is being increased, but with the limitations of draft in mind; and aluminum is being more frequently used for larger sized seine skiffs. West Coast crabbers, with an eye toward the developing scallop fishery, are turning to combination vessels with the larger gear and greater power that scallop fishing demands. To be suitable for both fisheries, these vessels will probably exhibit new design characteristics. Conversion is a feature of the vessel changes on the East Coast. Lower groundfish prices have encouraged some East Coast fishermen to convert their groundfish draggers to scallop boats; the application of purse-seine techniques to the sardine fishery reflects the increasing use of mechanical power instead of man power.

Looking at the overall picture, the author suggests a review of the cost problems facing U.S. fisheries: construction costs, market price structure, resource availability, and foreign operating and construction cost differentials. He recommends three amendments to the existing subsidy program to help stabilize cost variables: a fixed percentage subsidy, consistent funding, and removal of the hearing process.

Apparatus for dressing fish.

British Patent 1,121,626 (Copies available for $2.00 each from L. Janowski, 1050 Apple Lane, Lombard, Illinois 60148)
Nordischer Maschinenbau Rud. Baader
Food Technology 23, No. 1, 112 (January 1969)

FISH PROCESSING (BRITISH PATENT 1,128,263)

APPARATUS FOR DRESSING FISH (BRITISH PATENT 1,121,626)

2.1128 NEW DREDGE UNCOVERS POSSIBLE RICH FLORIDA CLAM INDUSTRY

Anonymous
Fish Boat 14, No. 1, 21, 39 (January 1969)

Up to now, the harvesting of clams in Florida has been a very meager industry. In 1966, only 6,000 lb. of clams was sold; their value was $2,000. One of the big reasons is that mechanical harvesters are illegal in Florida because of the possible damage their uncontrolled use could do to the shallow nursery areas that are so important to about 70 percent of Florida's other commercial species. And catch-as-catch-can harvesting with rakes that are dragged over the bottom is economically unprofitable. Now, however, the Florida Board of Conservation is hoping to convert this underutilized resource into a multimillion-dollar industry with a novel clam dredge, the RV Venus.

Purchased with $14,000 matching State and Federal funds, the Venus is a 68-by 12-foot, twin-pontooned vessel that can work in water as deep as 18 feet. When her jet-equipped boom is lowered to the bottom, the water forced from the jets loosens the bottom; then more jets force the clams onto a conveyor belt, which carries them, cleaned and ready for market, to the deck of the dredge.

The Board is using the Venus in a 3-year, $140,000 study aimed at (1) determining what species of clams inhabit Florida waters and how important they are,

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 ABSTRACTER: L. Baldwin

2.117B [BOATS]

Anonymous
Western Fisheries 77, No. 2, 22 ff. (November 1968)

(continued)

McEachern Building Four Brandlmayr Aluminum Boats, p. 30.--A South Burnaby boatbuilder is building four 33-ft. all-aluminum gill netters, one dispatch boat with the same hull and cabin design, and two 40-ft. all-aluminum gill netters. The 33-ft. boats, which were designed as rental boats, will have bare fish holds, two-station steering controls, a hydraulically driven aluminum drum, and five watertight compartments. One of the 40-ft. vessels will have an insulated hold with ice-holding coils; it can be converted to trolling.

38-Ft. Seacrete Combination By Carius, p. 32.--A round bottomed, semiplaning, combination troller-gill netter will be built of Seacrete, an extremely hard material that resists abrasion. The material is said to be maintenance free, easy to repair, and fire proof; it also provides sound and thermal insulation. The hull, deck, floors, and fuel and water tanks of the vessel will be of Seacrete; the deckhouse will be of plywood. Casting the hull, floors, and engine bed as a unit gives the bottom an immense amount of additional strength.

All six of these boats are illustrated with line drawings of the profile and the deck plan; In addition, photographs illustrating construction techniques accompany the description of the ferro-cement gill netter.

 ABSTRACTER: L. Baldwin

2.117A [BOATS]

Anonymous
Western Fisheries 77, No. 2, 22 ff. (November 1968)

Glass-Hulled Combination Has Compartmentalized Chillers, p. 22.--A 36-ft. combination gill netter-troller with a standard fiberglass hull is being built to fish off Southeastern Alaska. Her fish hold is divided into eight watertight compartments that are fitted with aluminum fish boxes, each of which will hold 700 lb. of salmon. The boxes have drain holes; thus the chilled brine will remain in the compartment when the boxes are lifted. The hold is completely insulated with plastic foam sandwiched between glass-covered plywood. The fish-carrying system eliminates the need for day boxes on each side of the drum, so the side decks are extended out to the bulkwarks on each side of the Cholberg narrow-type wooden drum; the hydraulic lines are hooked into the gurdies. The deck and deckhouse are of plywood covered with one layer of mat and painted.

38-Ft. Ferro-Cement Gillnetter By Ian Ross, pp. 24, 27.--The hull, deck, deckhouse, and all major bulkheads of this professionally built gill netter are of ferro-cement. The hull and the deck are being built as a unit; the bulkheads will be added later. The deckhouse will be finished in plasticized plywood, and the fish hold will be insulated with plastic foam. The hull, deck, cabin, and inside of the cement water tanks will be painted with urethane paint. The fuel tanks will be of steel.

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 ABSTRACTER: L. Baldwin

2.3 [CLEANING AND MAINTENANCE]

McCullough, J. J.
Food Processing 30, No. 1, 12-22 (February 1969)

Novel ideas for cleaning and maintaining plant equipment are described in the following articles:

1. "Jelly" proves fast, effective detergent medium, by J. J. McCullough (pp. 12-13). 4 photographs.

2. Central cleaning system drops steam, water use 60%, by William Holler and John J. McCullough (pp. 14-15). 2 photographs.

3. Lubricant foams dirt away, cuts conveyor drag, anonymous (p. 15). 1 photograph.

4. Heater strengthens FRP [fiberglass-reinforced pipe] joints, anonymous (p. 16). 1 photograph.

5. Automatic lubrication saves $1000/bottling line/year, by Albert B. Heilman (pp. 17-18). 2 photographs.

(over)

 ABSTRACTER: L. Baldwin

2.117A

Four 93-Ft. Combinations Building at Marco Yard, p. 27.--The Olympic, the Ocean Spray, the Keleen K, and the Rosie-G are sisterships being built to fish for king crab in Alaskan waters. However, they can easily be converted to shrimp drum trawlers, herring or anchovy purse seiners, or halibut longliners simply by a change of gear. The Rosie-G will be converted to a chilled sea-water salmon packer during the salmon season. The bows of these vessels have a pronounced flare. Their whaleback forecastles protect the crew and minimize the accumulation of ice. All fishing and deck gear, including a crab-pot hauler and topping and anchor winches, is hydraulically powered.

45-Ft. Cement Troller By Robert Allan, pp. 28, 30.--The hull, deck, tanks, bulkheads, and engine beds of this troller are of ferro-cement. The hull, which is being built around a cedar mold, has concrete longitudinal frames on 2-ft. centers. Unlike other ferro-cement vessels, the deck is being built separately from the hull. The deckhouse is of wood and is bolted to concrete coamings. Although the vessel is designed to meet the 15-ton inspection limit, she will be put through Canadian Steamship Inspection. Up to now no ferro-cement boat has been so inspected; thus designers, builders, fishermen, and government inspectors are showing appreciable interest in this troller.

(Continued on Card 2.117B)

2.3 (Cross Reference: 3.18)

6. Leaking pumps repaired without downtime, anonymous (p. 19). 1 photograph.

7. Sealer for tile floors eliminates waxing, anonymous (p. 19).

8. Rotating jet cleans 60 ft. tank cars in 20 minutes, by Ken Smargon and John J. McCullough (p. 20). 2 photographs.

9. Formulated liquid alkali improves bottle washing efficiency, by Harvey Lipsky and John J. McCullough (p. 21). 1 photograph.

10. Matches SS [stainless steel] finish to job, reduces tank clean-up time, anonymous (p. 22). 1 photograph.

2.3 SHRIMP AND SARDINE PROCESSING

United States Patent 3,407,435
Welcker, C., and R. Welcker
Food Technology 23, No. 2, 76 (February 1969)

Apparatus uses horizontal rollers and a sharp-edged center plate for deheading, peeling, and deveining raw shrimp and for cleaning sardines.

[Abstracter: F. T. Piskur]

2.1128 (Cross Reference: 1.82)

(2) learning the effects of a commercial clam dredge on various marine environments so it can be determined if the dredge should be permitted and what restrictions if any should be applied, and (3) locating and delineating clam populations that might be of commercial importance. Different bottom types are being thoroughly sampled. Later they will be resampled so the dredge's immediate and long-range effects can be analyzed.

The information gained from the study will be made available to other marine research agencies, for, the Board's assistant director says, the data gathered off the Florida coast will be applicable to all Gulf and South Atlantic areas. Records being compiled include those for costs. Thus prospective clam fishermen will know exactly what expenses they may incur if they use the dredge.

2.115 PARTIAL LIST OF FISHING BOAT BUILDERS

Prepared by Branch of Exploratory Fishing, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)
Fishery Leaflet 618, 12 pp. (November 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

The leaflet includes information on 238 shipyards in 26 states. The list of builders is divided into four geographic areas: Atlantic coast, Gulf Coast, Pacific Coast and Hawaii, and Great Lakes. Name of firm, address of firm, and material used in construction of boats (if known) are given.

[Abstracter: F. T. Piskur]

2.117 U.S. FISHING VESSEL CONSTRUCTION, 1968

Anonymous
Fish Boat 13, No. 12, 41-56 (December 1968)

The primary sections of this extended table are arranged by geographical area in order of the number of yards that are building fishing vessels: Pacific Coast, 50 yards; Gulf Coast, 16 yards; Atlantic Coast, 9 yards; and Great Lakes region, 3 yards.

In each area, the applicable states are listed alphabetically.

Under each listed state, the yards that are building fishing vessels are arranged alphabetically and their locations are given.

Four columns under each yard give the following information: (1) the number and type of vessels being built, (2) each vessel's name, (3) her owner and home port, and (4) miscellaneous particulars about the vessel--for example, her designer, main power specifications, distinctive instruments and gear, and auxiliary uses.

3.11 HOLDING RAW FISH (RED HAKE) IN ISOPROPYL ALCOHOL FOR FPC PRODUCTION

Dubrow, David, and Olivia Hammerle (Technological Laboratory, Bureau of Commercial Fisheries, College Park, Maryland 20740)
Food Technology 23, No. 2, 120-122 (February 1969)

Fish protein concentrate (FPC) must be made from prime quality fish. Present conventional methods are useful but may be costly and cumbersome depending upon the circumstances involved in the manufacture of FPC. Some alternative method is needed to store fish in a manner that maintains quality. Therefore, the purpose of this study was to determine the feasibility of preserving whole fish in isopropyl alcohol (IPA) for subsequent use in the manufacture of FPC.

Red hake, Urophycis chuss, was used. The ground fish were stored in 91 percent IPA at a w/w ratio of 1:13 (fish to IPA) for 1, 2, 4, 7, and 11 days at room temperature (22° C. ±2°). Each lot (defined by the storage period) was processed into FPC. The FPC was analyzed for proximate composition, amino acids, available lysine, and the nutritive quality of the protein.

Small losses of nitrogenous matter occurred as the time of exposure to IPA increased, thus decreasing the yield of FPC. Bacterial counts did not show any
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3.12 EFFECT OF NITROFURANS AND CHLORTETRACYCLINE ON MICROORGANISMS ASSOCIATED WITH SHRIMP

Waters, Melvin E., and M. K. Handy (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Pascagoula, Mississippi 39567; and Food Science Department, University of Georgia, Athens 30601)
Applied Microbiology 17, No. 1, 21-25 (January 1969)

Nitrofurans have been used in Japan for the preservation of seafood products. They have been used in the United States medicinally for humans and domestic animals; however, no attempt has been made to use the compounds as food preservatives. The purpose of the present study was to determine the effect of nitrofuran AF-2 and nitrofuran Z on bacteria isolated from fresh shrimp and to compare such results with those obtained by the use of chlortetracycline (CTC).

Mixed culture.--Nitrofuran AF-2 was more effective than nitrofuran Z in inhibiting the growth in nutrient broth of a mixed culture of bacteria isolated from shrimp. Nitrofuran Z was more effective than chlortetracycline. Ten µg. of nitrofuran AF-2 per milliliter (ml.) of nutrient broth was sufficient to inhibit growth of mixed bacteria; 50 µg. of nitrofuran Z per ml. was required to obtain the same degree of inhibition of bacterial growth. Fifty µg. of CTC per ml. produced the same inhibitory effect as did 10 µg. of nitrofuran AF-2 per ml. or 20 µg. of nitrofuran Z per ml.

(over)

3.15 INACTIVATION OF POLIOVIRUS TYPE 1 BY THE KELLY-PURDY ULTRAVIOLET SEAWATER TREATMENT UNIT

Hill, William F., Jr., Frederick E. Hamblet, and William H. Benton (Gulf Coast Marine Health Sciences Laboratory, Environmental Control Administration, U.S. Public Health Service, Dauphin Island, Alabama 36528)
Applied Microbiology 17, No. 1, 1-6 (January 1969)

The Kelly-Purdy UV (ultraviolet) Seawater Treatment Unit used to treat sea water in the purification (depuration) system for shellfish has been shown to destroy coliform organisms effectively. The purpose of the present study was to determine the effectiveness of ultraviolet radiation on poliovirus added to sea water. The poliovirus (vaccine strain) was selected as the test model virus to minimize the infection hazards involved in wet laboratory operations. Three experiments were carried out: the first two determined the effectiveness of the Kelly-Purdy UV Seawater Treatment Unit in inactivating poliovirus Type 1 (T_1) suspended in continuously flowing sea water; the third, a laboratory test, determined the survival of poliovirus in sea water under more rigid experimental conditions.

In experiment 1, the survival ratio of poliovirus T_1 was 2.3×10^{-4} (99.98 percent reduction) in 15.7 sec.; no virus was detected in 20.6 sec. The calculated half-life of the virus was 1.29 sec. In experiment 2, the survival ratio of poliovirus T_1 was 5.9×10^{-4} (99.94 percent reduction) in 11.7 sec.; no virus was detected in 15.7 sec. The calculated half-life of the virus was 1.37 sec. In the
(over)

3.15 BROWNING REACTION IN RADIATION-STERILIZED SEAFOOD PRODUCTS

Yu, T. C., Mary K. Landers, and R. O. Sinnhuber (Department of Food Science and Technology, Oregon State University, Corvallis)
Food Technology 23, No. 2, 90-92 (February 1969)

One problem that arises in the development of radiation-sterilized seafood products is nonenzymatic browning of the products during their storage at room temperature. The purpose of this study was to develop means of minimizing the browning discoloration of irradiated fish patties by (1) removing the reducing sugars, lipids, blood, and possibly 1-methylhistidine from the fish by leaching and (2) by adding bisulfite to the fish to block the reaction of the remaining sugars involved in the browning of the fish.

Frozen fillets of Pacific cod (Gadus macrocephalus) were used for preparing the samples. The patties were prepared from leached and unleached fish containing various binders and antioxidants. The irradiated samples received 4.5 Mrad at ambient temperatures and were stored at 22° C. and at 38° C. An accelerated browning reaction test was used in which several grams of the prepared fish sample were placed in a test tube, covered with aluminum foil, and heated in an autoclave for 1 hr. at 120° C.

The patties prepared from the leached fish--with lowered reducing sugar content--did not brown as readily as did the samples prepared from unleached fish.
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PRESERVING RED HAKE

NITROFURAN PRESERVATIVES FOR SHRIMP

DEPURATION OF SEA WATER

BROWNING IN RADIATION-STERILIZED SEAFOODS

3.12

Proteolytic bacteria.--Both nitrofuran AF-2 and nitrofuran Z were effective in suppressing growth of the proteolytic bacteria; however, the former was more effective.

Achromobacter aquamarinus.--One μg. of nitrofuran AF-2 or 5 μg. of nitrofuran Z per ml. of nutrient broth inhibited growth of A. aquamarinus; 20 μg. of CTC per ml. was required to produce the same effect.

The author suggested that further studies should be made to learn more about the mechanics of the inhibition of bacterial growth by nitrofuran compounds. Such information may provide the basis for greater utilization of these compounds as food preservatives. [USFDA has not approved nitrofurans for use in human food.] [7 figures, 25 references]

2.3 SHRIMP PROCESSING

United States Patent 3,408,686
Stephenson, F.
Food Technology 23, No. 2, 78 (February 1969)

A high-velocity stream of water is used to dehead shrimp.

[Abstracter: F. T. Piskur]

3.15

Only one sample of the irradiated patties--the one containing antioxidants, binders, SO_2, and $CaCl_2$--remained white.

Irradiated patties prepared from unleached cod stored at 22° C. or 38° C. for up to 300 days developed a yellow color; the patties prepared from the leached cod developed a gray color. The irradiated patties judged lightest in color were prepared from leached cod and contained (listed in order of lightness) (1) antioxidants and SO_2; (2) antioxidants only; and (3) no additives. [3 tables, 25 references]

3.334 CRUSTACEA CANNING

Japanese Patent 20142/68
Shimizu, T.
Food Technology 23, No. 2, 78 (February 1969)

Raw meat of crustacea is dipped in solution of glucose oxidase and hydrogen peroxide prior to canning.

[Abstracter: F. T. Piskur]

3.11 (Cross Reference: 6.54)

increase with storage time of samples. The nutritive quality of the FPC prepared from the IPA-treated samples was not impaired and the Protein Efficiency Ratios for all samples were significantly higher than that for casein. [6 tables, 9 references]

2.3 FISH TREATING APPARATUS

United States Patent 3,399,422 (Copies available for 50¢ each from Patent Office, U.S. Department of Commerce, Washington, D.C. 20231)
Hartl, E., A. Dudszus, R. Franz, C. Rethfeldt, G. Wienert, R. Muke, F. Hauptmann, and G. Bolze; Institut für Schiffbau
Food Technology 23, No. 1, 112 (January 1969)

Apparatus for dressing and filleting fish.

3.10 (Cross References: 3.4, 3.5)

APPLICATION OF STREPTOMYCES GRISEUS PROTEASE IN THE COLD ELECTROSMOKING AND SALT PICKLING OF FISH

Tsyperovich, A. S., A. M. Gudina, R. U. Muchukova, V. I. Bredyuk, A. A. Kaiitin, L. D. Bogina, and R. A. Rash (Inst. Biokhim., Kiev, U.S.S.R.)
Chemical Abstracts 70, No. 1, 2530s (January 6, 1969)

Typeroytch, A. S., A. M. Gudina, R. U. Muchukova, V. I. Bredyuk, A. A. Kaiitin,

3.15 (Cross Reference: 9.16)

laboratory test, experiment 3, the survival ratios of poliovirus T_1 were 9.7×10^{-3} (99.03 percent reduction) in 15 sec. and 3.6×10^{-4} (99.96 percent reduction) in 30 sec. The calculated half-life value was 2.38 sec.

The authors conclude that (1) ultraviolet radiation effectively inactivates poliovirus T_1 in flowing sea water and (2) the Kelly-Purdy UV Seawater Treatment Unit effectively treats sea water for use in commercial depuration systems. [2 figures, 5 tables, 20 references]

3.2349 (Cross Reference: 1.85)

FREEZE-DRYING OF SHRIMP

Lorentzen, J.
Konserves og Dybfrost 25, No. 10, 120-122 (1967) (In Danish)
World Fisheries Abstracts 19, No. 4, 37-38 (October-December 1968)

The article describes the method of freeze drying of shrimp. The freeze-drying process, however, is rather expensive because of high investments in the freeze-drying machinery. Thus, if freeze-drying is to be of commercial value the machinery should be highly exploited. It has been found that the cost of freeze-drying shrimp under Danish conditions will amount to about 2.5 percent of the price of the raw material. This calculation is based upon a plant with a capacity of 4 tons/24 hr., which is operated for 6,000 hr. a year. However, since it is a question of a luxury product like shrimp freeze drying seems to pay from an economic point of view.

[Extractor: F. T. Piskur]

SHRIMP PROCESSING (U.S. PATENT 3,408,686)

DRESSING AND FILLETING APPARATUS (U.S. PATENT 3,399,422)
ENZYMATIC PREPARATION FOR CURED FISH

CRUSTACEA CANNING (JAPANESE PATENT 20142/68)

FREEZE DRYING OF SHRIMP

3.15 EFFECTS ON GROWTH AND TOXIN PRODUCTION OF EXPOSURE OF SPORES OF CLOSTRIDIUM BOTULINUM TYPE F TO SUBLETHAL DOSES OF GAMMA IRRADIATION

Williams-Walls, N. J. (Engineering Experiment Station and School of Applied Biology, Georgia Institute of Technology, Atlanta, Georgia 30332)
Applied Microbiology 17, No. 1, 128-134 (January 1969)

The effects of ionizing radiation on Clostridium botulinum Type E have been reported, but such information is lacking for Type F. Type F, like Type E, is frequently found in aquatic locales; it has caused one botulism outbreak in the United States. The purpose of the present study was to determine the effects of sublethal doses of gamma irradiation on germination and outgrowth of spores of the Langeland strain of C. botulinum Type F and to determine any possible delayed effects on subsequent vegetative multiplication and toxin production from these spores in a growth medium less complex than fish flesh.

Spores of C. botulinum Type F were exposed to 0.0, 0.1, or 0.2 megarad of cesium-137 gamma irradiation and then grown at 30° or 10° C.

Growth of culture at 30° C.--Spores irradiated at the 0.2-megarad level and incubated at 30° C. reached the stationary growth phase 15 hr. earlier than did cultures irradiated at 0.1- or 0.0-megarad levels. This resulted from the elimination of a lytic phenomenon in the cultures irradiated at the higher level, a phenomenon noted in the cultures irradiated at 0.1- or 0.0-megarad after 26 and 29 hr. of incubation respectively. The time of toxin appearance in the supernа-

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 ABSTRACTER: F. T. Piskur

3.231 NEW ROTARY FREEZER DESIGNED FOR INDIVIDUAL FREEZING

Anonymous
Fishing Gazette 85, No. 13, 14 (December 1968)

A freezer that individually freezes fish fillets, shrimp, and other seafoods has been developed by a Florida firm. The basic freezing element is a rotating cylinder constructed of extra-heavy-gauge steel. This cylinder is a double-walled drum with an outer shell of ¼-in. stainless-steel plate. Between it and the inner shell, refrigerant flows in a spiraling pattern. The interior of the drum is filled with insulating material that forces the refrigerating effect outward. The entire apparatus is enclosed in an insulated housing, the inside of which is also refrigerated. Thus the air in the 2-in. cavity can be kept at subzero temperatures.

In operation, the seafood to be frozen is placed on a stainless-steel conveyor, the speed of which can be synchronized to match the surface speed of the revolving cylinder. The conveyor moves the seafood forward and deposits it on the outside surface of the cylinder at the top of its rotation. Since the cylinder's surface is kept at -65° F., the product adheres tightly the instant it touches. As the cylinder revolves, the product is solidly frozen by conduction. One revolution takes about 5 min., though the speed of rotation can be decreased to allow

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 ABSTRACTER: L. Baldwin

3.15 PROCEDURE FOR EVALUATING THE EFFECTS OF 2,450-MEGAHERTZ MICROWAVES UPON STREPTOCOCCUS FAECALIS AND SACCHAROMYCES CEREVISIAE

Lechowich, R. V., L. R. Beuchat, K. I. Fox, and F. H. Webster (Department of Food Science, Michigan State University, East Lansing 48823)
Applied Microbiology 17, No. 1, 106-110 (January 1969)

Previous reports in the literature revealed considerable disagreement concerning the effects of microwaves upon microorganisms.

Certain studies have indicated that inactivation of Escherichia coli and spores of Bacillus subtilis after exposure to microwaves was due to thermal energy. Other studies suggest that destruction of the microorganisms is due to the sole action of microwaves. The present paper reports on a study of the effect of heat and of microwave energy at 2,450-megahertz microwaves plus heat on the viability of Streptococcus faecalis and Saccharomyces cerevisiae, and on the respiration rate of S. cerevisiae.

A commercial 2,450-megahertz microwave oven was modified so that a 6 ml. suspension of bacteria could be uniformly exposed to a microwave field for various periods of time. The microorganisms were placed in the central tube of a modified Liebig condenser positioned in the approximate geometric center of the oven. Kerosene at -25° C. was circulated through the jacket of the condenser during

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 ABSTRACTER: F. T. Piskur

3.2382 MEASUREMENT OF VOLATILES TRANSFERRED FROM PLASTIC PACKAGING FILMS TO FOOD

Wilks, Robert A., Jr., and Seymour G. Gilbert (Department of Food Science, Rutgers University, New Brunswick, New Jersey 08903)
Food Technology 23, No. 1, 47-48, 51-52 (January 1969)

Detection of residual solvents in certain plastic films indicates a potential for solvent transfer to foods packaged in such materials. The residual solvents maycreate flavor changes in foods contacting the films. The ability to measure residual solvents in foods is prerequisite to determining the relation between residual solvent levels in films and the flavor changes produced in packaged foods. Sensory methods have been used but are time consuming and of limited precision. Therefore, the authors focused attention on the development of an objective method.

A hot-jar method is described whereby the sample is subjected to a heating cycle to vaporize the volatile compounds. The headspace gas is analyzed by gas chromatography. A PVDC [poly (vinylidene-chloride)] coated cellophanepolypropylene with a wide range of residual toluene levels was used (toluene is the adhesive solvent in this group of films). Cheese slices and cottonseed oil were used as the test foods.

The method easily detected toluene accumulation in cheese slices well before a sensory panel did. It was less effective with cottonseed oil.

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 ABSTRACTER: F. T. Piskur

EFFECT OF GAMMA IRRADIATION ON CLOSTRIDIUM BOTULINUM

EFFECTS OF MICROWAVES ON MICROORGANISMS

ROTARY FREEZER FOR INDIVIDUAL FREEZING

MEASUREMENT OF VOLATILES TRANSFERRED FROM FILMS TO FOODS

3.15 (Cross Reference: 0.5)

microwave exposure. The flow rate of the refrigerated kerosene was adjusted to permit the temperature of the bacterial suspension to range from 25° to 55° C. during exposure to the microwaves. Tests within the same temperature range using conductive heating were also carried out. Temperature of the suspension was recorded the instant the microwaves were turned off by means of a thermocouple-relay system. Suspensions of from 1.0×10^9 to 3.0×10^9 S. faecalis cells per ml. and from 1.0×10^8 to 4.0×10^8 S. cerevisiae cells per ml. were used.

Continuous application of 2,450 megahertz microwaves to suspensions of S. faecalis and S. cerevisiae appeared to produce no lethal effects other than those produced by heat. A decrease in the respiration rates of S. cerevisiae exposed to microwaves was related to the decreases in viable count of the organism produced by increased exposure time to the microwaves. [6 figures, 8 references]

3.2382 (Cross Reference: 7.9)

OXYGEN PERMEABILITY OF FLEXIBLE FILM PACKAGES FOR FOODS

Davis, E. G., and R. A. Burns (Commonwealth Scientific and Industrial Organization, Division of Food Preservation, Ryde, N.S.W., Australia)
Food Technology 23, No. 1, 92-94, 95-96 (January 1969)

Two methods were developed to determine the oxygen permeability of flexible-film packages. These methods are based on the increases in oxygen content in packages stored in air and filled with (1) nitrogen at atmospheric pressure and (2) nitrogen at reduced pressure. Sand is used as the inert filler. The two procedures gave similar results on hermetically sealed packages, but only the atmospheric-pressure method was suitable for packages made from films that are fragile or susceptible to leakage at the seals. The several types of heat sealers that were used to make the film-sealed packages showed no effect on the oxygen permeability of the packages. The authors suggest that packages be used for studying the influence of package design and fabrication variables on the oxygen permeability of flexible-film packages. [2 tables, 3 figures, 13 references]

[Abstracter: F. T. Piskur]

3.231 FISH PROCESSING

German Patent 1,280,080
Nordischer Maschinenbau Rud. Baader
Food Technology 23, No. 2, 78 (February 1969)

The equipment twists and pins fish fillets.

3.231 FREEZING PROCESS

United States Patent 3,404,989
Hirtensteiner, W.
Food Technology 23, No. 2, 17 (February 1969)

Foods are immersed in liquid nitrogen which has a boiling point of about -320° F.

[Abstracter: F. T. Piskur]

where they are subjected to several locations for the time needed to freeze thicker products. At the end of the freezing cycle, a spring-loaded bumper bar and a soft neoprene paddle wheel removes the frozen product from the drum.

The machine comes in two sizes, one rated at 500 lb. per hour and the other at 1,000 lb. per hour. The small machine requires a 10- to 12-ton refrigeration system; the large one, a 24- to 28-ton system. Either Freon or ammonia can be used in the systems. One machine requires roughly 8 sq. ft. of floor space. Neither has to be defrosted.

3.231

3.15 (Cross Reference: 0.5)

tant fractions of the cultures was independent of prior irradiation treatment and appeared after 36 hr. of incubation. Rate of release of toxin from cells was essentially logarithmic until maximal titers were reached. Maximal toxin titers were higher in irradiated than in unirradiated cultures. The toxin produced could not be trypsin-activated.

Growth of cultures at 10° C.--Spores irradiated at 0.2-megarad level and incubated at 10° C. showed no outgrowth, although germination of the spores did occur. Outgrowth of the culture exposed to the 0.1-megarad level was faster, with production of slightly higher quantities of more stable toxin, than was that of the unirradiated control. Trypsin-activation of the fractions was necessary to demonstrate the toxin present in the cultures.

The author believes that gamma irradiation in the 0.1- to 0.2-megarad range has stimulatory effects on growth and toxin production by spores of C. botulinum Type F and that, within the limits of the experiments, this stimulating effect increases with increasing radiation dosage. [4 figures, 27 references]

3.336 FISH PROCESSING

British Patent 1,126,644
Hochseefischerei und Fischverarbeitung
Food Technology 23, No. 2, 78 (February 1969)

Use of additives for fish eliminates the thawing step before canning.

[Abstracter: F. T. Piskur]

3.336 CANNING PROCESS

Canadian Patent 798,724
Zhavoronkova, Z. et al.
Tsentralnoe Konstruktorskoe Bjuro Ministerstva Rybnogo Khozaistva, U.S.S.R.
Food Technology 23, No. 2, 20 (February 1969)

Vibrating hopper is used to put foodstuffs, such as fish, into cans.

[Abstracter: F. T. Piskur]

3.239 THE CONNECTIVE TISSUE OF FISH.
I - THE INFLUENCE OF BIOLOGICAL CONDITION IN COD ON GAPING IN FROZEN-THAWED MUSCLE

Love, R. M., and I. Robertson (Torry Research Station, Aberdeen, Scotland)
Journal of Food Technology 3, No. 3, 215-221 (September 1968)

Fish fillets are structured mainly around contractile cells, which run roughly front to back, and sheets of connective tissue (myocommata), which run crosswise of the contractile cells. Usually all the tissues hold together, but sometimes the connective structures break down, the muscle blocks (myotomes) separate from the myocommata, and gaps appear in the fillet. When gaping is bad, the fillets cannot be sold, even though the taste and texture of the cooked fish are satisfactory. Gaping, therefore, is of considerable economic importance.

The authors are conducting a series of histological, physical, and chemical studies on myocommata to try to find out what holds fish together and what limits circumscribe the conditions under which gaping occurs. The part of the study reported here concerns the relation between the biological condition of the fish and the amount of gaping in the thawed flesh of fish frozen in rigor mortis, whole. Cod (Gadus morhua) caught on several grounds and at different times of the year were used.

In one test, the gaping in fish frozen immediately after death and in those frozen after being packed in ice for 20 hr. hardly differed. In other tests,

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 ABSTRACTER: L. Baldwin

4.81 REMOVAL OF CHLORINATED PESTICIDES FROM CRUDE VEGETABLE OILS BY SIMULATED COMMERCIAL PROCESSING PROCEDURES

Smith, Keith J., Percy P. Polen, D. M. De Vries, and Francis B. Coon (National Cottonseed Products Association, Inc., P.O. Box 12023, Memphis, Tennessee 38112)
Journal of the American Oil Chemists' Society 45, No. 12, 866-869 (December 1968)

Chlorinated hydrocarbons are used on many farm crops and are partially responsible for the increased domestic agricultural productivity during the past several years. Some concern has been expressed on the possible contamination of food products by the chlorinated pesticides. The objectives of the present study were to confirm previous reports that chlorinated hydrocarbons are removed from vegetable oils during processing, that during oil processing endrin would act similarly to other closely related chlorinated pesticides, and that endrin residues are not detectable in the edible oil.

Crude soybean and cottonseed oils were spiked with endrin, DDT, DDE, aldrin, dieldrin, heptachlor, and heptachlor epoxide. They were then processed using simulated commercial processing procedures. Following each step in the process, samples were analyzed for the presence of pesticides.

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 ABSTRACTER: F. T. Piskur

3.3343 PASTEURIZATION OF SHRIMPS BEFORE FREEZING

Thomsen, B. F.
Konserves og Dybfrost 25, No. 9, 104-109 (1967) (In Danish)
World Fisheries Abstracts 19, No. 4, 39-40 (October-December 1968)

The effect of heat treatment has been studied on: (1) boiled peeled unpacked shrimp, and (2) boiled peeled shrimp vacuum-packed in sealed plastic bags. The goals for these investigations were firstly, to obtain a sharp reduction in the bacterial count, and secondly to minimize losses of quality and yield resulting from the treatment.

It was decided that a temperature of at least 70° C. (158° F.) had to be reached throughout the shrimps during heat treatment. A larger liquid loss occurred with higher treatment temperatures as well as unfavorable change in the taste. Tests carried out in water at 85° C. (195° F.) demonstrated that after 5 min. the temperature in the center of 18-24 mm. (23/32-30/32 in.) thick bags averaged 64° C. (147° F.). In 13-15 mm. (17/32-21/32 in.) thick bags immersed in water at 85° C. after 3 min. the temperature in the center of the bag was 72° C. (161.8° F.), after 4 min. 75° C. (167° F.) and after 5 min. 78° C. (172.4° F.).

Experiments have been conducted on Greenland shrimp cooked and peeled within 3 hr. after landing. Pasteurization--5 min. at 85° C.--caused an immediate liquid exudate of 8-9 percent. The exudate, however, was reduced by half during cold storage and thawing. Some experiments were conducted with Greenland shrimp, which

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5.7 THE OXIDATION OF α-TOCOPHEROL DURING THE AUTOXIDATION OF ETHYL OLEATE, LINOLEATE, LINOLENATE, AND ARACHIDONATE

Witting, L. A. (L. B. Mendel Research Laboratory, Elgin State Hospital, Elgin, Illinois 60120)
Archives of Biochemistry and Biophysics 129, No. 1, 142-151 (January 1969)

The kinetics of autoxidation of polyunsaturated fatty esters in the presence of α-tocopherol in vitro was studied with a view toward formulating a description of the biological system. The effect of α-tocopherol on the autoxidation of ethyl oleate, linoleate, linolenate, and arachidonate in vitro at 37° C. was examined. The "efficiency" of α-tocopherol varied with concentration. At comparable concentrations, the relative efficiency of the antioxidant corresponded to the ratios of 40:1:0.5:0.25 for oleate, linoleate, linolenate, and arachidonate, respectively. Transition from slow to rapid autoxidation was dependent upon the accumulation of a critical level of hydroperoxide--which level was approximately 4, 160, 320, and 640 times the residual level of α-tocopherol for oleate, linoleate, linolenate, and arachidonate, respectively. When new free radicals were produced by the bimolecular breakdown of hydroperoxides, the rate of oxidation of α-tocopherol was affected by fatty acid ester structure. At low initial levels of the antioxidant (≤ 0.2 μmol./g.), the transition from slow to rapid autoxidation occurred before enough hydroperoxide was formed to support the bimolecular reaction. When new free radicals were generated by the unimolecular breakdown of hydroperoxides, the

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 ABSTRACTER: F. T. Piskur

EFFECT OF CONDITION ON GAPING IN FROZEN COD FILLETS

PASTEURIZING SHRIMP BEFORE FREEZING

CHLORINATED HYDROCARBON REMOVAL BY PROCESSING

TOCOPHEROL OXIDATION

3.3343 (Cross Reference: 2.3)

were kept overnight in a cool room after landing. With this raw material, there is a distinct difference between warm and cold peeled shrimp, in that somewhat more liquid was exuded from the latter. Pasteurization did not affect the quality of shrimp processed a few hours after catching, but shrimp held for the usual 24-hr. period between catching and processing were subject to a decrease in quality as a result of pasteurization, although even this was negligible.

A long series of investigations were carried out to evaluate a pasteurization apparatus. On the basis of this research, it was established that with a water temperature of 80° C. (176° F.) and a treatment time of 5 min., a temperature of over 70° C. (158° F.) can be attained in flattened bags. Further, this treatment, under practical conditions, is adequate to provide a total kill of all Staphylococcus and a very strong reduction in the total bacterial count. In addition, the temperature specified assures that any Salmonella present will be destroyed.

6.19 CHICK GROWTH RESPONSE TO ADDITIONS TO FISH MEAL DIETS

Schumaier, George W., and James McGinnis (Department of Animal Sciences, Washington State University, Pullman 99163)
Poultry Science 47, No. 5, 1717 (September 1968)

Paper presented at the 57th Annual Meeting of the Poultry Science Association.

6.190 (Cross Reference: 4.9)

EFFECTS OF ANTIOXIDANT ADDITION ON THE NUTRITIVE VALUE OF FISH MEALS

3.3344 (Cross Reference: 3.3349)

CRAB AND LOBSTER PROCESSING

Japanese Patent 20141/68
Tanabe Seiyaku Co., Ltd.
Food Technology 23, No. 2, 78 (February 1969)

3.239

however, gaping increased with the amount of time (up to 36 hr.) that death preceded freezing. The fillets from fish kept unchilled (up to 18 hr. at 18° C.) before freezing gaped excessively; some literally fell to pieces.

Counter to the findings of Gersh (1965) and Kaess (1966), ice invariably formed in the myocommata at every rate of freezing except, perhaps, very slow rates. Also, contrary to previous assumptions, the fillets from firm healthy fish, not from soft weak ones, gaped most when the fish were frozen 24 hr. after death (in rigor mortis). Presumably the strength of the muscular contraction during rigor, coupled with the weakness of myocommata debilitated by the growth of ice crystals, is sufficient to tear the myocommata apart. It was not surprising, then, that the fillets from cod caught shortly after spawning and frozen 20 hr. after death showed almost no gaping. Thus gaping in commercially caught fish can be brought on by handling the fish when they are in rigor mortis, allowing the temperature of the fish to rise by holding them on deck in an unchilled condition, or by freezing fish that are in good condition whole after the onset of rigor mortis. The authors suggest that if an entire catch cannot be frozen before rigor mortis sets in, the largest fish (which are frequently in poorer condition than the smaller ones) should be frozen last. [2 figures, 2 photographs, 23 references]

3.27 EFFECT OF THAWING TECHNIQUES ON THE NUTRITIVE VALUE OF SQUID

Korobkina, G. S., E. N. Danilova, N. N. Kalinina, K. E. Tsurkova, and N. A. Andreeva (Inst. Pitan. Akad. Med. Nauk, Moscow, U.S.S.R.)
Chemical Abstracts 69, No. 6, 24696 (August 26, 1968)

4.80 RAW MATERIALS FOR FATTY ACIDS

Combs, Durfee L. (Emery Ind., Inc., Cincinnati, Ohio)
Chemical Abstracts 69, No. 26, 10776la (December 23, 1968)

4.90 NUTRITIONAL EVALUATION OF FISH OILS IN LAYING HENS

Salomé, A., E. C. R. Creger, F. N. Farr, J. R. Couch (Department of Poultry Science, Texas A and M University, College Station 77843)
Poultry Science 47, No. 5, 1713 (September 1968)

Paper presented at the 57th Annual Meeting of the Poultry Science Association.

4.81 (Cross References: 6.13, 9.19)

Alkali refining or subsequent bleaching did not reduce chlorinated pesticide contamination. Hydrogenation prior to deodorization reduced the endrin level. Deodorization, with or without prior hydrogenation, eliminated chlorinated pesticides. Normal commercial processing of crude vegetable oils for human consumption effectively removes any chlorinated pesticides that may be present in the crude oils.

The author hypothesized that the chlorinated pesticides are volatilized during the deodorization process. [5 tables, 17 references]

5.7 (Cross Reference: 4.5)

rate of oxidation of α-tocopherol seemed to be independent of fatty ester structure. The author warns that failure to properly evaluate the effect of the concentration of α-tocopherol on the kinetics of α-tocopherol oxidation may lead to erroneous conclusions in experiments designed to determine the biological function of the antioxidant. [6 figures, 1 table, 38 references]

Paper presented at the 57th Annual Meeting of the Poultry Science Association.

FISH MEAL IN DIETS OF CHICKS
NUTRITIVE VALUE OF ANTIOXIDANT-TREATED MEAL
RAW MATERIALS FOR FATTY ACIDS
FISH OIL IN DIETS OF LAYING HENS

CRAB AND LOBSTER PROCESSING (JAPANESE PATENT 20141/68)

NUTRITIVE VALUE OF THAWED SQUID

6.54 RELATIVE ACTIVITIES OF COMMERCIALLY-AVAILABLE ENZYMES IN THE HYDROLYSIS OF FISH PROTEIN

Hale, Malcolm B. (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, College Park, Maryland)
Food Technology 23, No. 1, 107-110 (January 1969)

Soluble fish protein concentrates, produced through hydrolysis of the whole fish, offer certain advantages for use in soups, beverages, and infant formulations provided the flavor and nutritive value are satisfactory. However, if they are to be used for this purpose, they must be produced economically. The purpose of this study was to measure the capability of commercially available proteolytic enzymes to produce hydrolyzates of fish protein.

Twenty commercially available enzymes were measured for their activities in the digestion of a washed and freeze-dried fish protein substrate. The commercial enzyme preparations included: Pronase, 3 pepsins, 2 papains, panol, 2 trypsins, pancreatin, 2 ficins, Rhozyme P-11, Rhozyme PF, 2 bromelins, Bacterial Proteinase Novo, HT Proteolytic, Prolase, and fungal protease. Relative activities were based on the degree of digestion of the fish protein after 24 hr. The inverse measure of enzyme activity was the concentration of enzyme required to achieve 60 percent digestion of the protein in a 24-hr. period. Total soluble solids and insoluble solids were determined, and the data were used to calculate the degree of digestion.

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 ABSTRACTER: F. T. Piskur

6.54 THE FISH PROTEIN CONCENTRATE STORY
8. ON THE USE OF DETERGENTS IN FPC PRODUCTION

Connell, J. J. (Torry Research Station, Ministry of Technology, P.O. Box 31, Aberdeen, Scotland)
Food Technology 23, No. 2, 72-73 (February 1969)

The author comments on earlier work (unpublished) carried out at the Torry Research Station during 1965-67 on the use of detergents for treating fish intended to be used as fish protein concentrate. By this method, the protein was prepared from fatty fish by mixing the comminuted whole fish with an equal volume of water and a weight of sodium dodecyl sulfonate (SDS)--or other strong ionic detergent--sufficient to make a final concentration of 5 percent. Dissolution was accelerated by keeping the mixture at 60°-70° C.; the process was complete in 3-5 hours. The detergent solution of protein was separated from the fish oil, which floated, and the undissolved bone and skin, which settled. The protein was recovered from the protein-detergent solution by precipitating it with a water-miscible organic solvent or by acidification.

The product extracted with SDS, precipitated with organic solvent, and air-dried at room temperature was practically tasteless and odorless, had a low lipid and ash content, and had a SDS content not greater than 4 percent. The product extracted with SDS, precipitated at pH 3-4, washed with water, and dried in a vacuum oven was tasteless and odorless, had a low content of lipid, and had SDS content as high as 40 percent.

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 ABSTRACTER: F. T. Piskur

7.52 ASSESSMENT OF THE AVAILABILITY OF AMINO ACIDS IN FISH MEAL, SOYBEAN MEAL AND FEATHER MEAL BY CHICK GROWTH ASSAY

Smith, R. E. (Animal Research Institute, Research Branch, Canada Department of Agriculture, Ottawa, Canada)
Poultry Science 47, No. 5, 1624-1630 (September 1968)

In an earlier report, Smith and Scott (1965) described a chick-growth assay method for determining the availability of amino acids in intact proteins. More recent work by the author and others seems to indicate that the basis of calculation used in the method may be subject to question and that the availability of the test amino acid may have been overestimated. In the present study, the author made two changes: (1) when establishing the standard response curve for the test amino acid, he did not attempt to adjust the other amino-acid levels to those of the diet containing the intact protein, and (2) he determined the quantitative intakes of the test amino acid and used them rather than the dietary level of the test amino acid as the basis of calculation. Three meals were used for the study of intact proteins: fish meal, soybean meal, and feather meal.

The availability of the amino acids of fish meal and soybean meal was high, generally greater than 85 percent. The exceptions were: fish meal, leucine 73.3, valine 67.3, and arginine 62.6 percent; soybean meal, isoleucine 65.4, valine 57.9, and histidine 76.0 percent. Utilization of most of the essential amino acids in feather meal was poorer than in fish meal or soybean meal. It was suggested

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 ABSTRACTER: F. T. Piskur

7.89 COLOR SORTING OF RAW SALMON

Schmidt, P. J. (Fisheries Research Board of Canada Vancouver Laboratory, Vancouver 8, British Columbia), and R. M. Cuthbert (British Columbia Research Council, Main Mall, University of British Columbia, Vancouver 8, B.C.)
Food Technology 23, No. 2, 98-100 (February 1969)

The redness of canned salmon is an important element of quality because of consumer demand for food products of attractive color. Several problems exist in present grading systems: (1) visual grading is unsatisfactory because of eye-fatigue; (2) reference color standards are lacking; and (3) the necessarily destructive inspection of the canned product is wasteful. Therefore, the purpose of the present study was to develop a field-worthy objective method for evaluating the color of the raw salmon before they are processed. Such a method would be useful in predicting the color of the processed salmon. Reflectance measurements were made with a Beckmann spectrophotometer, Model DB; colorimetric measurements were made with a Gardner Colour-Difference Meter, Model C. Samples were prepared from sockeye (Oncorhynchus nerka) and coho (O. kisutch) salmon.

Good reproducible reflectance measurements were obtained by using a special glass-covered sample holder and neutral gray chips as reference standards. The ratio of the reflectances at 650 mμ and 510 mμ correlated well with the color of the raw flesh as measured by visual examination and by the ratio of a/b, a and b being Hunter values. The spectral reflectance measurements could, therefore,

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 ABSTRACTER: F. T. Piskur

HYDROLYZED FISH PROTEIN

FISH PROTEIN CONCENTRATE

ASSESSMENT OF AMINO-ACID AVAILABILITY

CANNED SALMON QUALITY CONTROL

7.52 AMINO ACID ANALYSIS EMPLOYING MICROBIOLOGICAL ASSAYS AND AUTOMATED ANALYZERS

Derse, Phillip H. (Wisconsin Alumni Research Foundation, Madison)
Feedstuffs 41, No. 6, 42 (February 8, 1969)

The author compares the two methods currently employed for amino-acid analysis: the microbiological and the analyzer methods. Although the various techniques used are generally satisfactory, two basic problems have not been resolved: (1) preparation of the sample for analysis to avoid destruction of the amino acids during hydrolysis and (2) the proper interpretation of the results in terms of biological values.

Two tables illustrate the shortcomings in the available techniques. The first table lists the results of a collaborative assay for 17 amino acids in a soybean meal and shows the variations that can occur from laboratory to laboratory and from instrument to instrument. Methionine and cystine analyses showed the greatest variability. The second table shows a direct comparison between the microbiological method and the amino-acid analyzer method for the analyses of methionine, cystine, and tryptophan in 14 feedstuffs. Agreement of data was only fair. [2 tables] [Abstracter: F. T. Piskur]

7.53 CORRELATION BETWEEN DIFFERENT METHODS OF FAT DETERMINATION AND OTHER ANALYTICAL DATA

Olsen, S., and S. Austeng
Meldinger fra SSF, No. 4, 167-176 (December 1967) (In Norwegian)
World Fisheries Abstracts 19, No. 4, 19-20 (October-December 1968)

The article presents the results of a series of fat determinations in fish meal carried out with ether, benzene, and chloroform/methanol (Olley-Hanson method). The authors call attention to the peculiarity that the total of crude protein (total N x 6.25), fat, ash, and moisture, which should be expected to approach 100 percent, appears to be fairly constant and characteristic for the respective factories. When fat is determined as ether extract, this total is normally well below 100 percent. With the Olley-Hanson method, the total of the four main constituents is increased well above 100 percent and becomes a characteristic of the raw material, the differences between the various factories leveling off. Benzene gives intermediate results between ether and chloroform/methanol extract (total lipids). [Reprinted in part]

7.89 (Cross Reference: 3.333)

provide a wholly objective characterization of the color of raw salmon flesh for use in predicting the color of the canned product prepared from the salmon. [9 figures, 2 references]

6.54 LONG-TIME ADVOCATE URGES: FPC TO FIGHT STARVATION

Anonymous
Food Technology 23, No. 2, 73, 75 (February 1969)

The report discusses briefly the development of the VioBin process for commercial production of fish protein concentrate (FPC) and the possible role of FPC in world food production. Of particular interest to processors is one suggested solution to the problem of economical preservation of the fish catch until delivered to the processing site. Whole fish treated with about 2 percent sulfur dioxide (added in the form of sodium bisulfite) will keep for 3 to 4 weeks when stored in a closed holding chamber. The article states that meal or FPC prepared from fish preserved with sodium bisulfite is of excellent quality. The cost of bisulfite-treatment is about US$2.00 per ton of whole fish.
[Abstracter: F. T. Piskur]

6.54 FISH MEAT EXTRACT

Japanese Patent 20137/68
Nichiro Gyogyo Kaisha Ltd.
Food Technology 23, No. 2, 78 (February 1969)

The method covers preparation of fish meat extract.
[Abstracter: F. T. Piskur]

6.54 FISH PRODUCT

Japanese Patent 20139/68
Takeda Chem. Inds. Ltd.
Food Technology 23, No. 2, 78 (February 1969)

Mixtures of boiled fish, wheat gluten, soybean protein, and seasoning are dried in heated lard. [Abstracter: F. T. Piskur]

6.54 (Cross Reference: 3.12)

Both methods of recovering protein from protein-SDS solutions were unsatisfactory. Use of organic solvents as precipitating agents offers no economic advantage over use of conventional solvent extraction processes. The acidification process is unsatisfactory because the detergent coprecipitates with the protein.

6.54 (Cross Reference: 0.38)

The enzyme ficin was the most active over a short period (1 hr. at 40° C.). Pronase was most active over the standard 24-hr. test period; pepsin, papain, and pancreatin produced good activity at moderate cost. The isoleucine and phenylalanine content of the hydrolyzates was lower than that of the fish protein substrate. The content of several essential amino acids in the trypsin hydrolyzate was lower than in the substrate. [1 figure, 4 tables, 7 references]

7.52

that the low availability of histidine of 0.0 percent and lysine of 5.3 percent may account for the poor nutritive value of feather meal. In an experiment to test the assay results, the amino-acid availability values for soybean meal and feather meal were confirmed. [5 tables, 9 references]

7.9 COLORIMETRY OF FOODS: THE MEASUREMENT OF COLOR

Clydesdale, F. M. (Department of Food Science and Technology, University of Massachusetts, Amherst 01002)
Food Technology 23, No. 1, 16-24 (January 1969)

"Color measuring" as defined by the author, simply means stating the color of an object in terms of numerical values. Interpretation of color, based on visual evidence, is affected by all kinds of personal biases. Also, it is almost impossible to describe a color in subjective terms. Therefore, some technique of objective measurement is necessary to describe the color of objects.

The author discusses various methods and instrumentation necessary to measure color: (1) color matching techniques that depend upon human judgment to recognize a color match in order to describe a color and (2) objective techniques that use an instrument to measure color.

Color involves three components: a light source, an illuminated object, and an observer. The Commission Internationale de l'Eclairage (C.I.E.) system (subjective) provides for a standard observer response and a specification of a standard source in terms of C.I.E. Standard Sources A, B, and C simulating incandescent light, noon sunlight, and overcast daylight, respectively. The third factor--an illuminated object--is the test color to be measured.

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 ABSTRACTER: F. T. Piskur

7.9 COLORIMETRY OF FOODS: COLOR AND TURBIDITY IN SOLUTIONS

Bernhardt, W. O. (Spreckles Sugar Co., Woodland, California)
Food Technology 23, No. 1, 30-31 (January 1969)

An accurate determination of the color of solutions is necessary in the control of quality of certain food products. Commercial acceptance of certain products, for example, sugar solutions and syrups, is often contingent on a specified maximum color. Where the solution of a pure product is normally colorless, the presence of slight coloration is evidence of impurities. In solutions where the coloration is very low, the color is conveniently expressed in terms of an absorption index at a specified wavelength. But, when the same solution shows a slight haze, the absorption index cannot be determined through a single measurement because the haze attenuates the transmitted light through scattering (turbidity). Rieger et al. (1959) found (for sugar solutions) that the additive relation of the indexes of absorption and scattering accounts for the total attenuation index of the light. Turbidity index and total attenuation indexes can be determined through appropriate measurements; the absorption index (the measure of light attenuation due to color) is the difference between the total attenuation index and the scattering (turbidity) index. However, the sugar industry recently realized that the interaction of a forward scattering by the test solution with the optical geometry of the photometers (used for transmittance measurements) caused serious errors in the results. Accordingly, the author's research group undertook to design a photometer capable of performing the determination.

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 ABSTRACTER: F. T. Piskur

7.9 COLORIMETRY OF FOODS: THE SAMPLE AS A PROBLEM

Little, Angela C., and Gordon Mackinney (Department of Nutritional Sciences, University of California, Berkeley 94720)
Food Technology 23, No. 1, 25-28 (January 1969)

In the application of colorimetry to foods, the task is frequently one of evaluating samples for the purpose of selection to meet certain requirements. The requirements may involve selection of raw material, color retention or development during processing, detecting deteriorative changes, or meeting market specifications. Objective measurements involve analytical procedures that give information that is related to the visual perception of color. In the food industry, the problem is not necessarily to manufacture a product that meets certain colorimetric specifications but to determine whether or not a product meets certain criteria of quality. In the present report, the authors discuss the problems of "color measurement" that are generated by the physical characteristics of the sample. Examples of sample problem areas ranging from simple opaque light-scattering to complicated interactions of transmittance, reflectance, specific absorption, and light-scattering are discussed.

Results obtained from measuring reflectance or transmittance characteristics of food are affected by the physical state of the sample, the method of presentation of the sample to the instrument, and the type of instrumentation used. The development of the proper methodology involves the control of these factors and

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 ABSTRACTER: F. T. Piskur

9.12 SPECIES ASSOCIATIONS OF BENTHIC FISHES ON THE CONTINENTAL SHELF AND SLOPE OFF OREGON

Day, Donald S. (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle, Washington), and William G. Pearcy (Department of Oceanography, Oregon State University, Corvallis)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2665-2675 (December 1968)

Benthic fishes of the Continental Shelf and Slope constitute an important part of our commercial fisheries. In the southeastern Pacific Ocean, exploitation of these fish stocks has taken place more rapidly than the knowledge necessary for their rational management has been obtained. The purpose of this work was to determine if species associations--that is, groups of species commonly living together--of benthic fishes can be ascertained from the analysis of catch data on fishes off the central coast of Oregon and to determine if the associations, if any, are related to the type of sediment on the bottom and to the depth of the water.

Samplings of the fishes of the bottom areas were made by a fishing vessel using a semiballoon shrimp trawl. Station positions were determined by Loran, using radar and echo-sounding equipment as supplementary navigational aids. A Dietz-LaFond sampler was used to collect sediment from the Continental Shelf; a Phleger corer was used on the Continental Slope.

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 ABSTRACTER: F. T. Piskur

7.9

the establishment of the levels between the measured dimensions and the visual response by psychophysical scaling techniques. The observations discussed in the report should be useful for establishing guidelines for the development of analytical methods that will yield information related to visual color perception and to the physical and chemical characteristics of food samples. [3 figures, 11 references]

[Abstracter: F. T. Piskur]

site could be estimated. The average depth of the combining site was estimated to be 10 Å. [12 figures, 19 references]

separated by systematically increasing the depth of the combining antibody combining site within ±1Å. By systematically increasing the depth of the "depth" of the haptens used as to allow an accurate measurement of the "depth" of the labeled site. Resonance and spin-labeling techniques were used. In these experiments the authors used a specific set of spin-labeled haptens designed to s

7.9 (Cross Reference: 0.112)

Instrumental measurements are divided into two parts: (1) spectrophotometry and (2) tristimulus colorimetry. The author describes in mathematical terms the measurement of the physical stimuli responsible for color and briefly explains what the terms represent.

Although color measurement basically consists of the specification of a point in three-dimensional space, under practical circumstances, such as in quality control, it would be advantageous to have only one or two variables rather than three. However, any function of color used for a particular product should first be correlated with the visual judgments of a subjective panel. Most single functions that combine the color coordinator are recommended only for a single product. [10 figures, 18 references]

7.599 (Cross Reference: 7.11)

SPIN-LABELING AND STUDYING ANTIBODY ACTIVE SITE IN A GENERAL METHOD

Hsia, J. C., and L. Piette, University of Hawaii, Honolulu)
Medicine, University of Michigan (Department of Biochemistry and Biophysics, School of Archives of Biochemistry and Biophysics 129, No. 1, 296-307 (January 1969)

The dimensional characteristics of the nature of the hapten combining site for rabbit anti-DNP antibodies with dinitrophenyl (1)- and dipeptide-labeled spin-labeled antibodies (2),4-DNP-tans were determined. The method of Electric Spin Resonance and spin-labeling was used. In these experiments the authors used a specific set of spin-labeled haptens designed to s

8.51 (Cross References: 1.24, 3.239, 6.195)

DETERMINATION OF AVAILABLE LYSINE IN FRESH AND FROZEN SARDINES AND IN SARDINE MEALS

Martins, Manuel Carvalho (Inst. Nac. Invest. Ind., Lisbon, Portugal)
Chemical Abstracts 70, No. 1, 253lt (January 6, 1969)

9.12 (Cross Reference: 2.12)

Sixty-seven species of fish representing 21 families were collected; 86 percent of the total number of fishes were from the families Pleuronectidae, Scorpaenidae, and Bothidae. Four associations of benthic fishes were found.

Number	Association: Dominant fishes: Species	Composition	Depth interval	Av. sediment type in percent of: Sand	Silt	Clay
		Percent	Meters			
1	Citharichthys sordidus	64.0	42-73	100	-	-
	Parophrys vetulus	16.3				
2	Lyopsetta exilis	66.4	119-199	69	19	12
	Glyptocephalus zachirus	11.4				
3	Sebastolobus altivelis	49.7	594-1143	17	55	28
	Sebastolobus alascanus	30.9				
4	Coryphaenoides acrolepis	51.6	1383-1829	1	53	46
	Sebastolobus altivelis	26.3				
	Antimora rostrata	14.7				

Overlap among species associations was slight because many species had maximum abundance or were only in one association. The species occurring in more than one association were often of different sizes. The species on the lower Continental Slope had the broadest depth range. The association at the lowest depth contained only a few species. [3 figures, 5 tables, 16 references]

7.9 (Cross Reference: 0.112)

A schematic diagram of the optics of the sphere photometer that was designed is given. Two measurements are made: one giving the total attenuation, the other the amount of scatter. The absorption index is the difference between these two values. The author suggests that the photometer can be used for many solutions other than sugar solutions where the determination of coloration and turbidity is required. [2 figures, 1 table, 2 references]

8.59 (Cross Reference: 0.39)

ADRENALINE AND NORADRENALINE IN CARP, CYPRINUS CARPIO, ORGANS AT REST AND UNDER STRESS

Stasiovskii, E. M. (Inst. Evol. Fiziol. Biokhim. im. Sechenova, Leningrad, U.S.S.R.)
Chemical Abstracts 70, No. 1, 1254t (January 6, 1969)

7.53 DETERMINATION OF CRUDE OIL IN FISH SCRAP FOR FERTILIZER. I - EXTRACTION METHOD BY ACETONE AND POTASSIUM CHLORIDE

Motohiro, Terushige, Minoru Akiba, Sadao Yoshimoto, Eiichi Tanikawa (Hokkaido Univ., Hakodate, Japan)
Chemical Abstracts 69, No. 19, 76032g (November 4, 1968)

9.12 SHARK PIT ORGANS: RESPONSE TO CHEMICALS

Katsuki, Yasuji, Keiji Yanagisawa (Laboratory of Sensory Sciences, University of Hawaii, Honolulu); Albert L. Tester, and James I. Kendall (Department of Zoology, University of Hawaii)
Science 163, No. 3865, 405-407 (January 24, 1969)

The electrophysiological response to mechanical and chemical stimulation of nerve fibers from pit organ fibers and canal neuromasts in 29 small nurse sharks (Ginglymostoma cirratum) was recorded on tape and displayed on the screen of an oscilloscope. The fibers from canal organs responded readily to light touch on the denticles of the skin, whereas those from pit organs responded only to pressure. However, the spikes from the response of pit organ fibers were larger (being from 1 to 3 mv.) than those from canal organ fibers (which were less than 1 mv.), and the activity lasted longer (from 2 to 3 hr. rather than ½ hr.).

Canal organ fibers did not respond to salinity changes in the environment, whereas the response of pit organ fibers increased with increasing concentration of salt. The response of pit organ fibers to 1M solutions of KCl and RbCl was high, to 1M NaCl and NH_4Cl was medium, and to 1M CsCl and LiCl was low. Chlorides of the divalent cations calcium and magnesium, particularly of calcium, inhibited response. Since choline chloride elicited no response, the authors concluded that the cation rather than the anion is the cause of excitation.

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 ABSTRACTER: L. Baldwin

9.13 RELATIONSHIP BETWEEN OXYGEN CONSUMPTION AND SWIMMING SPEED IN THE HADDOCK, MELANOGRAMMUS AEGLEFINUS

Tytler, P. (Department of Biology, University of Stirling, Stirling, Aberdeen, Scotland)
Nature 221, No. 5177, 274-275 (January 18, 1969)

In 1964, Brett found a linear relation between the logarithm of oxygen consumption and swimming speed in several species of fresh-water teleosts. Little or no such information exists for marine species, though the need for it would be invaluable to fishery ecologists. As a step toward supplying this need, the present author tested five 2-yr.-old haddocks in a modified Blazka tunnel respirometer.

First the fish were thermally acclimatized in a recirculating sea-water aquarium for 2 mo. at 10° C., during which time they were fed to satiation. Then they were starved for 25 hr. and transferred to the tunnel respirometer, where they were left for 20 hr. During the 20-hr. period, the fish learned to face into a water flow of 3.5 cm./sec. Their oxygen consumption was measured with a Beckmann laboratory oxygen analyzer coupled to a linear potentiometric recorder. Water flow was then increased to 10 cm./sec., and in 10-cm./sec. increments until the fish were fatigued. The velocity of each flow was maintained for 45 min., oxygen uptake being measured for the first 30 min. at each speed. During the final 15 min., the concentration of oxygen in the respirometer was returned to air saturation by passage of fully saturated sea water at 2 l./min.

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 ABSTRACTER: L. Baldwin

9.14 COMMERCIAL FISH PRODUCTION IN U.S. AND ITS RELATIONSHIP TO THE FEED INDUSTRY

Meyer, Fred P. (Fish Farming Experimental Station, Bureau of Sport Fisheries and Wildlife, U.S. Fish and Wildlife Service, Stuttgart, Arkansas)
Feedstuffs 41, No. 7, 27-28 (February 15, 1969)

The author suggests that fish culture, America's new livestock industry, presents a refreshing development in agricultural enterprise. Fish presents a crop whose production knows no surplus, no acreage control, and no price regulation. It commands a good market image and a high sale price. Fish farming, too, serves as a conservation measure by helping to retain water in farming areas, to contain erosion, and to reclaim land too wet for arable crops.

The author gives a brief history of trout, catfish, and baitfish farming. Of particular interest is a table of the general guidelines for catfish and trout feeds, as follows:

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 ABSTRACTER: F. T. Piskur

9.16 IMPROVED OYSTER FARM PRODUCTION MAY BE NEW PEARL TO FF [FROZEN FOOD] FIELD

Adler, Cyrus, and George Claus (Offshore/Sea Development Corporation)
Quick Frozen Foods 31, No. 6, 79-81, 142-144 (January 1969)

The future of the fisheries industry lies in controlled breeding of the product, especially in those species considered delicacies by the gourmet. The rate of development and the increase in lower-cost yields will vitally influence the frozen-food industry. The authors discuss the commercial value of one of these species, the oyster, the techniques of culturing and harvesting it, and some of the problems affecting attainment of its full potential.

Of the many marine animals used as food by man, bivalves are the most easily farmed. They are sedentary, thus they can be concentrated into relatively small areas where they can be easily harvested. They are extremely fecund, so disease-resistant stocks can be easily bred. Most of them can tolerate wide fluctuations in temperature and salinity, and most can stand relatively high levels of pollution.

In 1967, the United States produced 127,400,000 lb. of oysters and clams alone, worth $51,100,000. Of this amount, oysters accounted for almost 45 percent of the poundage and over 60 percent of the dollar value. In 1968, the 250 oyster farms in North America supplied more than 65 percent of the 60,000,000 lb. of oysters consumed. Highest prices were paid for the rare west coast Olympia oyster.

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 ABSTRACTER: L. Baldwin

RESPONSE OF SHARK NERVE FIBERS TO STIMULATION

OXYGEN CONSUMPTION OF SWIMMING HADDOCK

FISH CULTURE

COMMERCIAL POTENTIAL OF OYSTER FARMING

9.13 (Cross Reference: 1.52)

The relation between the logarithm of oxygen uptake and swimming speed was clear for each haddock. However, the slope of the lines and the extrapolated standard metabolic rates varied considerably. The line of best fit for the massed data (expressed as $\log_{10}Y = 0.33x + 1.77$, where Y is the oxygen consumption in milligrams per kilogram per hour and x is swimming speed in body lengths per second) was considered highly significant--$r = 0.885$ and $P = 0.001$. A comparison of this equation and the equations found by other authors for Lepomis gibbosus at 20° C. and Oncorhynchus nerka at 5° C. supports the suggestion that relative metabolic rates of fish are dependent on the thermal environment.

The haddock showed a strong rheotropic response, swimming uniformly at all water speeds without mechanical or electrical stimulus. The maximum cruising speed was 2.1 body lengths per second, much lower than that found for other species, possibly because the fish could not exercise while they were in the aquarium and were, therefore, out of condition. Condition factors differed considerably, the lower the condition factor, the lower the standard metabolic rate ($r = 0.826$ and $P = 0.05$). These factors were seemingly related to the maximum active metabolic rate. Thus, the author concludes, changes in the condition factor (weight/(body length)^3) of these particular fish probably reflect changes in fat content rather than the relative weight of body musculature. [1 figure, 2 tables, 4 references]

Haddock	Metabolic rate		Condition factor
	Standard	Active	
1	51	310	1.0705
2	62	230	1.1768
3	34	300	0.9654
4	40	275	0.8492
5	64	265	1.0907

9.16 (Cross Reference: 1.81)

Next were prices for the American oyster, which brought as much as $2.50 a pound in New York and New England. The Pacific oyster, which was imported from Japan to take the place of the decimated Olympia populations, brought only about $0.50 a pound in Oregon.

The techniques of culturing oysters have changed little over the past 20,000 years. Although efforts are being made to produce bigger and more predictable harvests, the methods used are still at the stage where land-crop methods were when man first began to plant seeds. If oyster farmers are to reach the present level of the land-crop farmer, they must cultivate their product from seed to maturity under precisely defined conditions, including control of its environment. For optimum growth, an oyster needs 86° F. temperature, 27°/$_{oo}$ salinity, 7.2 pH, and about 1,000,000 algal cells per milliliter of length. If it is kept during its whole life under these conditions, it can reach marketable size in 12-18 months rather than in the 4-5 years required under natural conditions.

Commercial production of oysters decreased drastically after World War I. The decrease has been ascribed to the increase in estuarine pollution, which kills the young, causes eutrophication (thereby affecting the oyster's food supply), and greatly increases the number of potentially harmful bacteria accumulating in the oyster's body (thereby making it unfit for human consumption). Although some states are attempting to control pollution, the effect of the programs will not be felt until 1975. Some skeptics say it will never be felt, since the means of pollution control may not be advancing at a sufficient rate to keep up with the increased pollution resulting from an expanding population.

9.12 (Cross Reference: 1.79)

Solutions that would be expected to stimulate taste buds had the following effect on the discharge rate in pit organ fibers: 0.06N hydrochloric acid in sea water, none; 0.06N hydrochloric acid in distilled water, a reduction; 0.083N acetic acid in distilled water, a reduction; 1M sucrose plus 1M sodium chloride, none or a reduction; 1M sucrose in distilled water, complete inhibition; and 0.005-0.003M quinine sulfate in sea water, a reduction. From these results, the authors conclude that the response of shark pit organs is not typical of the response of mammalian taste buds. [1 table, 2 figures, 6 references]

9.14 (Cross Reference: 9.16)

Component	Requirements for: Catfish	Trout
	Percent	Percent
Basic		
Total protein[1/]	30	35-40
Carbohydrate (allowable)	40	30
Fat	6-8	8-10
Fiber	10	4
Vitamins	Amount or units per ton of feed	
Vitamin A (USP)	4.5×10^6	3×10^6
Vitamin D_3 (I.C.)	2×10^6	0.64×10^6
Vitamin E (I.V.)	1.5×10^3	216×10^3
Riboflavin (mgm.)	3×10^3	100×10^3
D-calcium pantothenate (mgm.)	6×10^3	48×10^3
Folic acid (mgm.)	400	80×10^3
Niacin (mgm.)	35×10^3	500×10^3
Choline chloride (mgm.)	0.4×10^6	1×10^6
Vitamin B_{12} (mgm.)	10	20
Vitamin K (mgm.)	1×10^3	--
D-biotin (mgm.)		400
Ascorbic acid (mgm.)	--	240
Thiamine hydrochloride (mgm.)	--	60×10^3
Pyridoxine hydrochloride (mgm.)	--	20×10^3

1/ To include at least 15 percent for catfish and 30 percent for trout.
[2 tables]

9.17 ELECTRICAL INSTALLATION FOR CONTROL OF THE NORTHERN SQUAWFISH

Maxfield, Galen H., Gerald E. Monan, and Holbrook Garrett (Biological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Seattle, Washington, 98102)
Special Scientific Report--Fisheries No. 583, 14 pp. (February 1969) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

Electricity was used experimentally to divert and trap squawfish during their spawning migration in 1958 at Cascade Reservoir, Idaho. Electrical fields, created by sequentially energizing a V-shaped array of vertically suspended round electrodes with square-wave, d.c. pulses, were evaluated as a means of diverting squawfish into traps.

Three test conditions of varied pulse frequency, pulse duration, and voltage were tested. Two sets had a pulse frequency of 10 pulses per second (2 per field per second when five fields were pulsed in sequence), a pulse duration of 50 msec., and voltages of 140 and 180 v.; one set had a pulse frequency of 15 pulses per second (3 per field), a pulse duration of 25 msec., and a voltage of 180 v. One set (pulse frequency, 10 pulses per second; pulse duration, 50 msec.; and voltage, 180 v.) was repeated.

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 AUTHORS' ABSTRACT

9.4 MARINE SCIENCE AFFAIRS -- A YEAR OF BROADENED PARTICIPATION

The Third Report of the President of the Congress on Marine Resources and Engineering Development, For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Price $1.25, 251 pp. (January 1969)

This report summarizes the accomplishments of all the agencies and departments of the United States in the field of marine sciences during 1968. It describes Federal policies and programs, and identifies the goals and milestones.

The first chapter summarizes the major policy recommendations of the Marine Sciences Council and describes the fiscal year 1970 Federal marine sciences budget by agency, by public purpose, and by marine science function. The second chapter discusses the Nation's stake in the oceans in terms of marine geography--a physical, social, economic, and political geography. The remainder of the report delineates the Federal program by categories of purpose. The next six chapters describe Federal programs serving the following purposes: expanding international cooperation and understanding; enhancing benefits from the Canal Zone; strengthening military programs for national security; accelerating use of food from the sea; encouraging development of nonliving resources; and facilitating transport and trade. Three chapters follow devoted to special new programs and policies: launching the International Decade of Ocean Exploration; advancing the

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 ABSTRACTER: F. T. Piskur

9.2 A REPORT ON COSTS AND EARNINGS OF NEWFOUNDLAND FISHING VESSELS

Proskie, John (Economic Services, Federal Department of Fisheries, Ottawa, Canada)
Fisheries of Canada 21, No. 7, 13-23 (January 1969)

This preliminary report contains operational and financial summaries for 16 vessels fishing out of Newfoundland ports during 1967. The vessels were grouped as follows: wooden longliners (5, averaging 38 feet in length), steel side trawlers (3, averaging 120 feet in length), steel side trawlers (5, averaging 129 feet in length), and steel stern trawlers (3, averaging 148 feet in length). A table gives the average age, tonnage, and engine power of each group; the text describes their electronic gear.

The report contains tables detailing the following information:
Total landings by species for all four types of vessels in 1967, showing the buying classification of each species, the number of pounds landed, the total value, and the average price per pound. (A supplementary table gives the number of classifications, by species, used in buying fish from the trawlers; the longliners reported no landings of rejected fish.)
Total landings by species of fish rejected in 1967, showing number of pounds landed, landed value, and price per pound. (Rejected fish may be used for meal.)
Average operational performance of all four types of vessel in 1967, showing the average number of men in the crew, number of trips, days at sea, days and

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 ABSTRACTER: L. Baldwin

9.6 ANNUAL REVIEW & CLASSIFIED DIRECTORY OF MARINE AND SHORE PLANT EQUIPMENT

Anonymous
Fishing Gazette Annual Review Number 85, No. 11, 190 pp. (November 1, 1968)

This review begins with Secretary of the Interior Stewart L. Udall's annual message to Fishing Gazette's readers: "Success Demands Total Outlook." Six major sections follow:

1. Engine Digest. The manufacturer, model, and specifications are given for diesel marine engines, gasoline marine engines, auxiliaries and electric plants, and outboard motors.

2. Classified Directory of Marine and Shore Plant Equipment and Supplies.

3. Marine Electronics Digest. The specifications for "all models of all leading manufacturers" of marine electronic equipment are listed.

4. Buying Guide to Equipment and Services for the Industry. Vessel construction, refrigeration, transportation, processing, packaging, and industrial products are covered; most of the equipment is illustrated.

5. Statistical Survey (catch, production, employment, fishing craft, and establishments). Six figures and 11 tables are included.

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 ABSTRACTER: L. Baldwin

9.4 FISHERIES RESEARCH BOARD OF CANADA
ANNUAL REPORT - 1967

Anonymous
Annual Report 1967, Fisheries Research Board of Canada, var.p. (1968) (Ottawa, Canada) (In English; in French)

Chairman's Review.--Expansion of physical facilities of the FRB (Fisheries Research Board), admission of Canada to membership in the International Council for the Exploration of the Sea, establishment of the Office of the Editor, and the reasons for a concentration of grants to universities are mentioned.

Research Programs in 1967.--Examples of the work carried out by FRB in five general areas are given. These areas are the environment, the resource, increasing the resource, harvesting and management, and commercial products. Two pie charts, one showing the operating costs for FRB areas of research and the other showing the geographic distribution of FRB operating costs in 1967-1968, conclude the report. [Abstracter: L. Baldwin]

9.6 SELECTED WATER RESOURCES ABSTRACTS

Anonymous
Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Virginia 22151 (December 1968)

The Water Resources Scientific Information Center, Office of Water Resources Research, U.S. Department of the Interior, is issuing a new abstract journal. The abstracts in this semimonthly publication are derived from monographs, journal articles, reports, and other published sources. They cover such subjects as groundwater, lakes and estuaries, water yield, watershed protection, waste treatment, water pollution, water demand, water law, hydraulics, and soil mechanics.

Subscription price for the journal is $22.00 a year ($27.50 foreign); single copies are $3.00 each; both are payable in advance. Checks and money orders should be made payable to the Clearinghouse. [Abstracter: L. Baldwin]

9.15 (Cross References: 0.4, 1.37)

EFFECT OF SUBLETHAL DDT ON THE LATERAL LINE OF BROOK TROUT, SALVELINUS FONTINALIS

Anderson, John M. (Department of Biology, Carleton University, Ottawa, Canada)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2677-2682 (December 1968)

Although the chlorinated hydrocarbon insecticide DDT (1,1,1-trichloro-2,2-bis-(p-chlorophenyl) ethane) is known to affect the central and peripheral nervous tissue, few studies have been carried out on its effect on fish. The present paper reports on some effects of 24-hr. exposure of brook trout (Salvelinus fontinalis) to sublethal amounts of DDT on the neurophysiological functioning of the trunk lateral line nerve. The lateral line nerve of the brook trout responds to an abrupt low-frequency pressure wave (generated by a falling drop of water's hitting the surface of the water directly over the trout's lateral line canal) by emitting a relatively short, high-frequency, burst of large spikes. The effect is greater at lower than at higher temperatures. Exposure of the brook trout to sublethal doses of DDT greatly prolong the response of the nerve, and the effect is more pronounced at the lower temperatures. [2 figures, 9 references]
[Abstracter: F. T. Piskur]

0.4 (Cross Reference: 1.79)

ADRENERGIC BLOOD PRESSURE RESPONSES IN THE SHARK

Schwartz, Sorell L. (U.S. Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland), and Joseph F. Borzelleca
Science 163, No. 3865, 395-397 (January 24, 1969)

Mammalian studies over the past two decades have led to the concept of alpha and beta receptors for the reaction of animals to catecholamines. Usually vasoconstriction follows stimulation of alpha receptors and vasodilatation follows stimulation of beta receptors. Whereas isoproterenol stimulates only the beta receptors, epinephrine stimulates both.

Seventeen nurse sharks (Ginglymostoma cirratum) and 19 lemon sharks (Negaprion brevirotris) recovered slowly from administered doses of epinephrine and isoproterenol, recovery time following administration of epinephrine increasing as the adrenergic agent was increased. Both sympathomimetic agents elicited a response similar to that in mammals. However, the depressor response to epinephrine in the sharks did not occur until after a maximum pressor response had occurred; in mammals, the depressor response precedes the pressor effect. Only when the sharks were first treated with dibenzyline, an alpha-receptor blocking agent, did epinephrine elicit a decrease in blood pressure to below control values. [2 figures, 7 references] [Abstracter: L. Baldwin]

2.117 FRP [FIBER-REINFORCED PLASTIC] TAKES THE FLEET

Anonymous
Chemical Week 104, No. 5, 28 (February 1, 1969)

The glass-fiber-producing capacity of the United States is about 516 million pounds a year. Reinforced plastics normally contain 30 percent glass fiber (by weight). In 1968, nearly 201 million pounds of FRP ([glass]-fiber-reinforced plastic) was sold to the marine and marine accessories market. This figure represents a 30 percent increase over the 1967 figure; an additional 25 percent increase is projected for 2969.

This article deals with the portion of the market controlled by each of the three major U.S. glass-fiber producers, their marketing techniques, and their sales outlets. Prospects are that, since FRP pleasure boats have proved successful, boat manufacturers will branch out into FRP commercial vessels; 73-foot shrimp trawlers are expected to lead the way. [Abstracter: L. Baldwin]

0.7 CHRONOLOGIC CHANGES IN THE RECOMMENDED DIETARY ALLOWANCES

Miller, Donald F. (Division of Nutrition, Bureau of Science, Food and Drug Administration), and LeRoy Voris (Food and Nutrition Board, National Academy of Sciences-National Research Council, Washington, D.C.)
Journal of the American Dietetic Association 54, No. 2, 109-117 (February 1969)

Here for the first time are tabulated the chronological changes that have been made in "Recommended Dietary Allowances" from the first to the latest edition--1943, 1945, 1948, 1953, 1958, 1964, and 1968. Also included are corresponding requirements set by the Food and Drug Administration in 1941. Not only will these tables serve as a historical record, but they will be valuable to those who wish to reassess older dietary surveys in the light of newer knowledge and standards of adequacy. [8 tables, 13 references] [Abstracter: L. Baldwin]

3.231 FREEZING APPARATUS

United States Patent 3,404,802
L. Bettcher
Lab-O-Matic Corp.
Food Technology 23, No. 2, 17 (February 1969)

A tubular container for food to be frozen expands as the food increases in volume during freezing. [Abstracter: F. T. Piskur]

NUTRITION AND MEDICINE

NUTRITION AND MEDICINE
U.S. FISHERIES, MIDDLE AND SOUTH ATLANTIC

FISHING VESSELS
TOXICITY

PROCESSING FROZEN FISH

1.01111 THE EEL FISHERIES OF EASTERN CANADA

Eales, J. G. (Zoology Department, University of Manitoba, Winnipeg)
Fisheries Research Board of Canada, Bulletin 166. Obtainable from the Queen's Printer, Ottawa, Canada. Price $1.75
Fisheries of Canada 21, No. 7, 27 (January 1969)

About 2,000,000 lb. of American eels (Anguilla rostrata) are taken each year in Eastern Canada, about 70 percent from the St. Lawrence River. The author describes the biology of the eel, its migrations, and some of the fisheries it supports. He suggests ways of expanding small eel fisheries, especially those in the Maritime Provinces.

Photographs illustrate the great variety of gear used for catching eels, and appendices give lists of Canadian dealers and foreign importers and the prices paid to fishermen. [Abstracter: L. Baldwin]

1.01111 RESOURCE DEVELOPMENT IN THE MARITIMES AND NEWFOUNDLAND. REVIEW OF 1967 ACTIVITIES

Anonymous
Fisheries of Canada 21, No. 5, 11-24 (November 1968)

[Illustrated]

0.6 (Cross Reference: 0.8)

FORECASTING THE TECHNOLOGY OF THE 1970's

Anonymous
Chemical Engineering 76, No. 1, 88-108 (January 13, 1969)

The editors of Chemical Engineering have collaborated on a preview of the challenges facing chemical engineers over the next decade. Among the subjects covered are general trends in processing methods and equipment, the techniques of process control, new tools and techniques for the design engineer, information retrieval systems, energy-conversion activity, and pollution control. In the last section of the survey, Eugene Guccione and Henry S. Gordon deal with bioengineering developments--new sources of proteins, biomaterials and artificial organs, biofuel cells, and ocean technology. Their discussion of the growth in industrial ocean technology ends with a series of questions about the future ownership of ocean spaces; the cooperation to be expected between federal and state bodies, private and public sectors; and the role of the United Nations in resolving problems affecting distribution of the ocean's resources.
[Abstracter: L. Baldwin]

0.6 TASTE OF "MISO" AS A SEASONING. II

Ito, Kiyoe (Tokyo Liberal Arts Univ., Tokyo, Japan)
Chemical Abstracts 69, No. 15, 58442m (October 7, 1968)

3.63 (Cross Reference: 1.81)

POWDERED OYSTER PRODUCT

Japanese Patent 20143/68
Nichiro Gyogyo Kaisha Ltd.
Food Technology 23, No. 2, 78 (February 1969)

Oyster meat is treated with hydrogen peroxide at 60°-85° C., then dried and powdered. [Abstracter: F. T. Piskur]

3.63 DEHYDRATION PROCESS

United States Patent 3,408,210
Heyman, W.
Food Technology 23, No. 2, 17 (February 1969)

Solid foodstuffs are coated with acetylated monoglycerides then dehydrated under vacuum. [Abstracter: F. T. Piskur]

3.63 (Cross Reference: 3.2349 DEHYDRATION PROCESS

British Patent 1,118,670
Lamb-Weston Inc.
Food Technology 23, No. 2, 17 (February 1969)

Food products are freeze dried just sufficiently to produce a porous surface layer; then they are air dried. [Abstracter: F. T. Piskur]

2.3 (Cross Reference: 1.85)

MACHINE PEELING

Andersen, V.
Konserves og Dybfrost 25, No. 7, 82-89 (1967) (In Danish)
World Fisheries Abstracts 19, No. 4, 29-30 (October-December 1968)

In a shrimp plant on the west coast of Greenland, shrimp peeling machines were installed in 1960, and a number of peeling experiments have since then been carried out. The peeling machine had been designed for peeling uncooked shrimps, and during the first year the shrimps were peeled in the raw condition. However, in this way it was not possible to obtain a product with the red color that characterizes this species.

It was found that cooked shrimp could be peeled too, if cooking took place immediately before peeling. To begin with, the shrimps were steam cooked, but steam cooking was difficult to control. Later a water cooking apparatus was constructed.

The machine is not able to peel fresh shrimps; they have to be kept in ice for some time before peeling, if an acceptable yield is to be obtained. On the other hand, the fresher the shrimps when peeled, the better will be the quality and, in particular, the color of the finished product. At the plant in Greenland, the shrimps are now kept in ice for 1 day before processing.

The last part of the article deals with the economic aspects of machine peeling of shrimps. [Extractor: F. T. Piskur]

4.14 EXAMINATION OF ISOPRENOID FATTY ACIDS AS DISTINGUISHING CHARACTERISTICS OF SPECIFIC MARINE OILS WITH PARTICULAR REFERENCE TO WHALE OILS

Ackman, R. G., and S. N. Hooper (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia)
Comparative Biochemistry and Physiology 24, No. 2, 549-565 (February 1968) (Pergamon Press, New York, N.Y.)

The report discusses the potential of using three isoprenoid fatty acids as "markers" for distinguishing oils derived from higher marine life forms, particularly from whales. The proportions of 4,8,12-trimethyltridecanoic acid (I), 3,7,11,15-tetramethylhexadecanoic (phytanic) acid (II), and 2,6,10,14-tetramethylpentadecanoic (pristanic) acid (III) were compared in samples of 12 fish oils and 14 oils from marine mammals.

Antarctic and North Atlantic fin whale oils could be distinguished. The former had a much lower level of (I) than of (II). The results suggest a correlation of the gradation in the proportions of the three fatty acids from Antarctic whale oil through North Atlantic whale oils to seal oils with the change in food intake from a primarily zooplankton diet, through a partial fish diet, to an exclusive fish diet. Furthermore, in both the fish and the marine mammal oils, a decrease in the ratio of L,D,D to D,D,D diastereomers for (III) and (II) correlated with a high level of (I) and suggested a relation to fat catabolism.
[3 figures, 3 tables, 68 references] [Abstracter: F. T. Piskur]

6.134 ON THE PERFORMANCE OF THE DIRECT-HEAT ROTARY DRYER

Utvik, A. Ø.
Meldinger fra SSF, No. 2, 52-80 (May 1968) (In Norwegian)
World Fisheries Abstracts 19, No. 4, 45-46 (October-December 1968)

The author points out that for heat sensitive materials such as herring meal, the direct-heat rotary dryer must operate by concurrent flow of hot air and the material to be dried. He shows in an example that with the same consumption of fuel oil there is only a slight reduction in capacity when lowering the inlet temperature from an extreme of 900° to 600° C.(1652° to 1112° F.) if the air-mass velocity is raised correspondingly.

With regard to quality, feeding tests carried out at SSF some years ago, showed no difference in nutritive value between a herring meal dried in a properly operated direct heat dryer and in a meal from an indirect steam dryer.
[Extractor: L. Baldwin]

6.54 EFFECT OF CALCIUM ON THE UTILIZATION OF PROTEIN CONCENTRATE

Habibullah, Khan, and Ehsan Ali Mohammad (West Reg. Lab., Pakistan Council Sci. Ind. Res., Lahore, Pakistan)
Chemical Abstracts 69, No. 19, 74875k (November 4, 1968)

4.2 SYNTHESIS OF ^{14}C-LABELLED POLYUNSATURATED FATTY ACIDS

Marcel, Yves L., and Ralph T. Holman (University of Minnesota, The Hormel Institute Austin)
Chemistry and Physics of Lipids 2, No. 2, 173-182 (June 1968)

In connection with studies of metabolism of essential fatty acids, the authors prepared a sequence of labeled polyunsaturated fatty acids so they could investigate the influence of the fatty acids' structure, chain length and position of double bonds, on their enzymatic chain elongation and desaturation in vitro. The present report describes the preparation of all-cis polyunsaturated fatty acids labeled with ^{14}C in positions one and three. The polyunsaturated moieties of the fatty acids were synthesized according to established procedures. The methyl esters were reduced to the corresponding alcohols, and the alcohols were converted to the methanesulfonates. The methanesulfonates were reacted with K^{14}CN to yield the nitriles. Treatment of the nitriles with HCl/methanol/H_2O produced the methyl esters of the 1-^{14}C-labeled fatty acids

Preparation of 3-^{14}C-eicosa-8,11,14-trienoic acid from 1-^{14}C-octadeca-6,9,12-trienyl methanesulfonate, and of 3-^{14}C-eicosatrienoic acid, is described.
[2 figures, 3 tables, 20 references] [Abstracter: F. T. Piskur]

7.43 A PRACTICAL HANDBOOK OF SEAWATER ANALYSIS

Strickland, J. D. H. (Marine Food Chain Research Group, Institute of Marine Resources, La Jolla, California), and T. R. Parsons (Fisheries Research Board of Canada Biological Station, Nanaimo, British Columbia)
Fisheries Research Board of Canada, Bulletin 167. Obtainable from the Queen's Printer, Ottawa, Canada. Price $7.50
Fisheries of Canada 21, No. 7, 27 (January 1969)

Although automation is currently used to analyze sea water, methods and equipment are still in the exploratory stage. The authors introduce the subject with a brief outline of the methods they have found to be reliable and adequately sensitive and precise for most studies of marine ecology.

This bulletin is a completely revised and updated version of Fisheries Research Board Bulletin 125, A Manual of Seawater Analysis, published by the present authors in 1960. It contains 20 more methods than the earlier work contained, many involving a considerably more sophisticated approach. New sections cover automated analysis and the electronic sizing and counting of particles. The book is not intended to serve as a comprehensive treatment of the methods of sea water analysis but rather to supply full working instructions about how to follow the procedures devised by the authors during more than 2 years of sea-going experience. As a rule, the procedures can be mastered by relatively inexperienced workers in a ship's laboratory; the required apparatus is simple.
[Abstracter: L. Baldwin]

6.134 DRYER FURNACES AND OIL BURNERS

Kahrs, L.
Meldinger fra SSF, No. 2, 73-79 (May 1968) (In Norwegian)
World Fisheries Abstracts 19, No. 4, 45-46 (October-December 1968)

The paper deals exclusively with oil-heated furnaces, the only type used today in Norwegian herring meal factories.

It is essential that burner, furnace, brickwork, dryer, and ventilation system work as one unit. It must therefore be carefully planned. The furnace must satisfy a number of requirements: easy, quick and exact adjustment of heat production, combining maximum capacity with optimum quality of the dried meal. The paper describes in detail the calculation of furnace dimensions, based on total gas volume and taking into consideration the amount of water to be evaporated, heat losses and adequate protection of the brickwork. Next are described various types of oil burners, rotating burners, burners with steam or air atomizing. The choice of type must depend on local conditions, judging the burner on capacity and ease of regulation. The quality of the fuel oils is of primary importance, and the burner must be adjusted in accordance with the viscosity.
[Extractor: L. Baldwin]

French Patent 1,500,163
Bonnet, Pierre M. J.
Chemical Abstracts 70, No. 1, 2603c (January 6, 1969)

6.55 (Cross Reference: 8.43) MARINE SALTS IN ANIMAL FEED

4.13 (Cross References: 1.12, 3.30, 8.51)

CANNED TUNA. III - FATTY ACID COMPOSITION OF LIPID FROM NORMAL GREEN, AND BROWN MEAT

Kouchi, Masayuki (Shimonoseki Univ. Fish., Yamaguchi, Japan)
Chemical Abstracts 70, No. 1, 2532u (January 6, 1969)

4.14 (Cross Reference: 1.953)

COMPOSITION OF NEUTRAL LIPIDS AND THEIR FATTY ACIDS FROM WHALE BRAINS. III - GLOBICEPHALUS MELAENA BRAINS

Lesch, Peter, Sylvia Neuhaus-Meier, Karl Bernhard (Univ. Basel, Basel, Switzerland)
Chemical Abstracts 70, No. 1, 1422w (January 6, 1969)

4.21 ESTIMATION [OF] THE DEGREE OF OXIDATION OF FISH FAT

Pereplетchik, R. R. (U.S.S.R.)
Chemical Abstracts 69, No. 9, 34766u (August 26, 1968)

7.42 COLLABORATIVE STUDY OF THE DETERMINATION OF SODIUM AND POTASSIUM IN FISH AND OTHER MARINE PRODUCTS

Thompson, Mary H. (Technological Laboratory, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Pascagoula, Mississippi 39201)
Journal of the Association of Official Analytical Chemists 52, No. 1, 55-61 (January 1969)

This paper reports on the collaborative study of the flame photometric method for determining sodium and potassium in fishery products. Two methods for preparing the fishery product samples for analysis were tested: a dry-ash method and a wet-ash method. It was found that both methods were equally efficient, the accuracy being within that inherent in the instrument used. The author recommended that both methods for preparing fishery product samples for flame spectrophotometric analysis be adopted as official first action methods by the Association of Official Analytical Chemists. [3 tables, 5 references]
[Abstracter: F. T. Piskur]

6.14 BULK STORAGE OF MEAL IN CONTAINERS

Anonymous
Meldinger fra SSF, No. 1, 31-32 (February 1968) (In Norwegian)
World Fisheries Abstracts 19, No. 4, 43 (October-December 1968)

The article suggests that the use of containers might be favorable for inside storage. As an example, dimensions, weights, and prices are given for containers made of aluminum. [Extractor: F. T. Piskur

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6.190 FEED FOR MINK

French Patent 1,500,997
Société Anon. de Recherches pour Applications Thérapeutiques "Sarath"
Chemical Abstracts 70, No. 1, 2605v (January 6, 1969)

6.193 A SHORT CHICK ASSAY FOR UNKNOWN GROWTH FACTORS

Bhargava, K. K., and M. L. Sunde (Department of Poultry Science, University of Wisconsin, Madison 53706)
Poultry Science 47, No. 5, 1655 (September 1968)

Paper presented at the 57th Annual Meeting of the Poultry Science Association.

9.13 (Cross References: 7.591, 7.593)

LOCALIZATION OF CREATINE KINASE IN THE STARCH-GEL AND MOVING BOUNDARY ELECTROPHORETIC PATTERNS OF FISH MUSCLE

Gosselin-Rey, C., G. Hamoir, (Departmenc of General Biology, Institute Ed. Van Beneden, University of Liège, Liège, Belgium), and R. K. Scopes (Agricultural Research Council, Meat Research Institute, Langford, Nr. Bristol, England)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2711-2714 (December 1968)

The results of this study suggest that the creatine kinase of the muscle of carp, and probably of other fish, differs from the enzyme of mammals in having a lower isoelectric point and a lower specific activity. The lower specific activity is mostly compensated for by the presence of two or three times as much enzyme relative to other sarcoplasmic proteins in the carp as in mammals.
[3 figures, 16 references] [Abstracter: F. T. Piskur]

9.13 THE ACTION OF PHENOTHIAZINES ON PIGMENT CELLS OF THE FLATFISH SCOPTHALMUS AQUOSUS

Scott, George T. (Oberlin Coll., Oberlin, Ohio)
Chemical Abstracts 69, No. 1, 1024x (July 1, 1968)

9.19 DETOXIFICATION OF PESTICIDAL RESIDUES IN FISH AND SHELLFISH

Hallab, Abdul Hamid (Louisiana State Univ., Baton Rouge)
Chemical Abstracts 70, No. 1, 2488j (January 6, 1969)

9.19 (Cross Reference: 9.15)

WATER CONTAMINATION BY PESTICIDES

Nicholson, H. P. (Southwest Water Lab., Atlanta, Georgia)
Chemical Abstracts 69, No. 26, 109637p (December 23, 1968)

9.16 (Cross Reference: 1.51)

CRYOGENIC PRESERVATION OF ATLANTIC COD (GADUS MORHUA) SPERM

Mounib, M. S., P. C. Hwang, and D. R. Idler (Fisheries Research Board of Canada Halifax Laboratory, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2623-2632 (December 1968)

The purpose of this investigation was to preserve the sperm of cod in the frozen state and have them retain the capacity to fertilize eggs. The goal was successfully achieved; sperm of cod were deep frozen to -79° C. or -196° C. in the presence of protecting agents. The most satisfactory condition was the freezing of a mixture containing 1 part semen and 3 parts of a medium consisting of 40 parts 0.4 M NaCl–0.1 M glycine; 8 parts of 1.3 percent sodium bicarbonate; and 10 parts of glycerol. A freezing rate of 5° C./min. was better than one of 1° C./min.

Frozen sperm stored at -196° C. for up to 60 days showed average fertility of 36±12 percent; fresh sperm showed 79±6 percent on the same batch of eggs.
[5 tables, 22 references] [Abstracter: F. T. Piskur]

9.13 LIFE BELOW ZERO

Dunninger, Bruce L. (Yale Univ., New Haven, Connecticut)
Chemical Abstracts 69, No. 3, 8519w (July 15, 1968)

9.6 FISHERIES YEAR BOOK AND DIRECTORY 1968-69

Tysser, Harry F. (Ed.)
British-Continental Trade Press Ltd., London, England. 444 pp. (n.d.)
Fisheries of Canada 21, No. 7, 27 (January 1969)

This book covers practically every aspect of the fishing industry from the cultivation and catching of fish to their distribution and use. The "World Survey" chapter contains reports from all important fishing countries on fish supplies and sales. Other chapters cover the activities of research institutions, new methods of cultivating fish and shellfish, quick freezing and marketing, and the latest developments in vessel construction and equipment. The "World Directory" section lists over 5,000 companies and firms engaged in the production and distribution of seafoods in 68 countries. Also specially listed are organizations, trade associations, and fishing trade journals throughout the world.
[Abstracter: L. Baldwin]

8.59 (Cross Reference: 9.19)

ZINC AND COPPER IN THE TISSUES OF DECAPOD CRUSTACEANS

Bryan, G. W. (Plymouth Lab., Plymouth, England)
Chemical Abstracts 69, No. 17, 65414g (October 21, 1968)

9.16 (Cross Reference: 1.3)

EFFECTS OF CHILLED STORAGE ON VIABILITY OF STORED OVA AND SPERM OF SOCKEYE AND PINK SALMON

Withler, F. C., and R. B. Morley (Fisheries Research Board of Canada Biological Station, Nanaimo, British Columbia)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2695-2699 (December 1968)

Earlier work on sockeye (Oncorhynchus nerka) and pink (O. gorbuscha) salmon showed that ova and milt without added water could be held at 8°-9° C. for at least 8-12 hours without loss of fertility, and that pink salmon milt might retain its initial fertility for up to 33 hours. The purpose of the present study was to examine the possibility that use of lower storage temperatures might prolong the fertile period. The authors determined the fertility of ova and milt of sockeye and pink salmon, without added water, held at ambient stream temperatures and at refrigeration temperatures. They found that lowering the storage temperature to about 3° C. provided a period of from 2 to 4 days longer that the sex products remained highly fertile. The results further indicated that, on a practical basis, some contact of the stored ova and milt with air is permissible.
[2 figures, 5 references] [Abstracter: F. T. Piskur]

French Patent 1,501,855
Chemical Abstracts 69, No. 25, 105243j (December 16, 1968)

9.14 FISH GROWTH STIMULANTS

9.6 (Cross Reference: 9.2)

PRODUCT INNOVATION IN FOOD PROCESSING 1954-1964

Buzzell, R. D., and R. E. M. Nourse
Product Innovation in Food Processing 1954-1964 (Division of Research, Graduate School of Business Administration, Harvard University, Soldiers Field, Boston, Massachusetts 02163 [1967]) Price $6.00
Reviewed by Samuel M. Weisberg
Food Technology 23, No. 2, 56 (February 1969)

This book examines the impact of product innovation on the food processing industry. Inasmuch as new items have represented 20 to 25 percent of the total annual sales volume since 1954, their impact has been considerable. Also, there seems to be a direct relation between the rate of growth of food processing firms and their rate of new product development.

Of particular interest is the analysis of the comparative costs of various inputs for developing a new product. For each new product, research and development averages US$68,000, marketing research $26,000, and test marketing $248,000. Market expenditures for a new food product during the first year of regular distribution averages 43 percent. Although new product failures are often stated to be as high as 80 or 90 percent, the authors suggest a figure of about 40 percent. They conclude that new products, in the aggregate, tend to reduce food costs to the consumer--even though some are expensive, many of the convenience foods are less expensive than the home-prepared equivalent.

Food processors and distributors should find this book of value.
[Abstracter: F. T. Piskur]

9.13 (Cross Reference: 1.88)

METABOLISM OF THE RADIOISOTOPE ^{65}Zn IN THE FRESHWATER MUSSEL ANODONTA CALIFORNIENSIS

Pauley, Gilbert B., and Roy E. Nakatani (Departments of Biology and Ecosystems, Battelle Memorial Institute, Pacific Northwest Laboratory, Richland, Washington)
Journal of the Fisheries Research Board of Canada 25, No. 12, 2691-2694 (December 1968)

^{65}Zn is one of the principal gamma-ray emitters of biological significance. Certain mollusks, such as oysters, mussels, and clams, accumulate ^{65}Zn from sea water and, therefore, may serve as biological indicators of the isotope in the marine environment. Because no comparable analyses exist for the isotope in fresh-water mollusks, the authors studied the metabolism of ^{65}Zn in the fresh-water mussel Anodonta californiensis.

After 36 days' exposure of the mussels to specified test levels of ^{65}Zn, 75 percent of the ^{65}Zn accumulated was in the gills, mantle, and palps. The radioisotope was accumulated intercellularly and intracellularly; little was adsorbed on the surface of the animals. The absorption of ^{65}Zn into the tissues of the fresh-water mussel, A. californiensis, probably occurs through the epithelium of the mantle of the gills and through the wall of the digestive tract.
[4 figures, 1 table, 4 references] [Abstracter: F. T. Piskur]

9.4 AGENCY FOR AIR AND SEA

Anonymous
Chemical Week 104, No. 3, 22 (January 18, 1969)

The President's Commission on Marine Science, Engineering and Resources has recommended creation of a Government agency, the National Oceanic and Atmospheric Agency (NOAA), that would work with industry on a broad range of programs to develop and protect the nation's marine environment. Included in the programs are exploration of the marine frontier and its interrelations with the atmosphere; definition of marine resources and advancement of capabilities for their use; provision of supporting services, including weather and ocean forecasts; minimization of conflicts over uses of the marine environment; coordination of scientific and technical requirements and recommendations in support of foreign policy objectives; and performance of services for marine industry and marine interests of the American people.

The Commission foresees bringing several Government functions together within NOAA: the Coast Guard, the Environmental Science Services Administration (now under the Department of Commerce), the Bureau of Commercial Fisheries and part of the Bureau of Sport Fisheries and Wildlife (now under the Department of the Interior), part of the Army Corps of Engineers (the part charged with functions in the Great Lakes), the Sea Grant College program, and possibly other functions and agencies later. [Abstracter: L. Baldwin]

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